

Alignment of the Itokawa shape model with AMICA observations using Laser Altimetry and Optical Navigation

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1 Summary

This document shows how well a combination of laser altimetry and optical navigation acquired by the HAYABUSA spacecraft permits determining the approximate trajectory of the Hayabusa spacecraft relative to the asteroid Itokawa. We show here all the 1024 x 1024 AMICA images acquired during the Hayabusa's encounter with Itokawa that were employed to develop the most recent shape models of this asteroid. These data were also used to derive the trajectory of the spacecraft [R. W Gaskell et al., 2008]. The expected approximate location of the asteroid given this trajectory is shown in green with a white outline and is overlain on the gray observed asteroid. The pointing solutions and orbits employed to outline these shape models on the HAYABUSA images provide the ancillary data that are part of the AMICA data delivered to the Planetary Data System. This file indicates that for most images present, the ancillary data is very good (within 1m or so of their actual location and pointing). The methodology here, which uses both the Laser Altimetry and Optical navigation data differs from the one that depends only on Laser Altimetry, which is the source of the laser altimetry derived spacecraft trajectory files delivered to the PDS for Hayabusa. The latter, while slightly less accurate, is better than the data presented here for when AMICA images are not collected, since none of the wide angle images could be sent to the ground during the encounter of HAYABUSA with Itokawa. The black diamond in each image indicates the location of the altimeters footprint on the surface of the asteroid.

References

R. W Gaskell, O. S. Barnouin-Jha, D. J. Scheeres, A. S. Konopliv, T. Mukai, S. Abe, J. Saito, M. Ishiguro, T. Kubota, T. Hashimoto, J. Kawaguchi, M. Yoshikawa, K. Shirakawa, T. Kominato, N. Hirata, and H. Demura. Characterizing and navigating small bodies with imaging data. *Meteoritics and Planetary Science*, 43:1049, 2008.

2 AMICA image

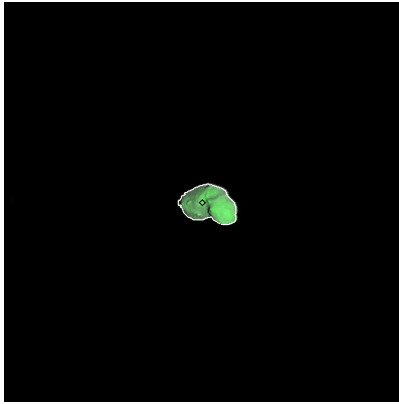


Figure 1: ST_2367722441_v.fits

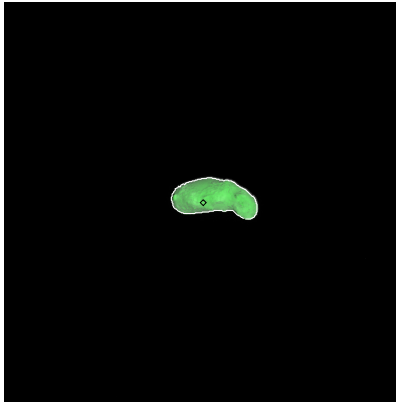


Figure 2: ST_2367901002_b.fits

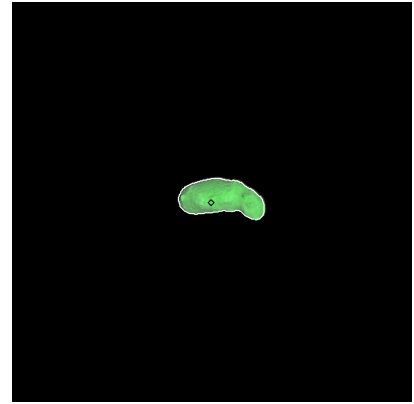


Figure 3: ST_2367939436_v.fits

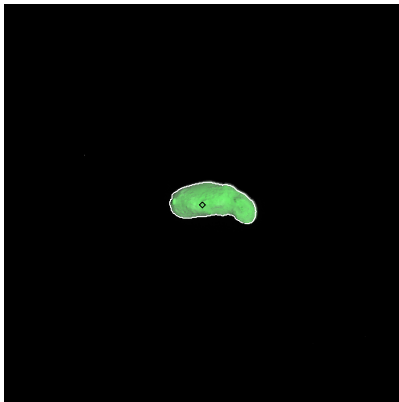


Figure 4:
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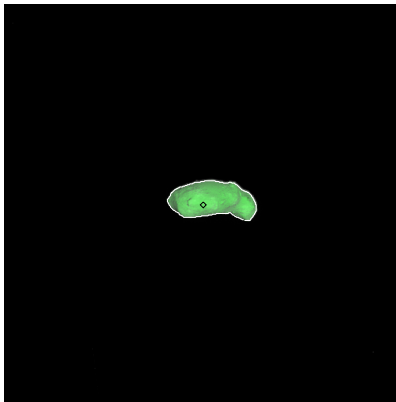


Figure 5: ST_2368071882_v.fits

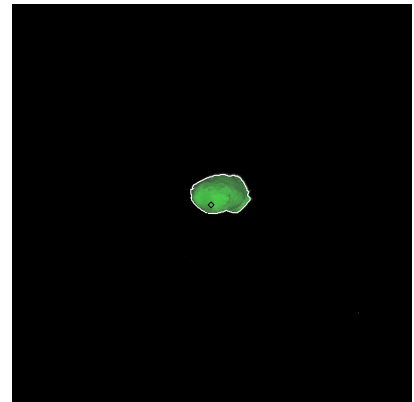


Figure 6: ST_2368246601_v.fits

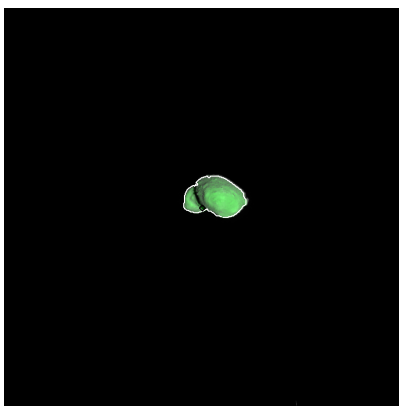


Figure 7: ST_2368423234_v.fits

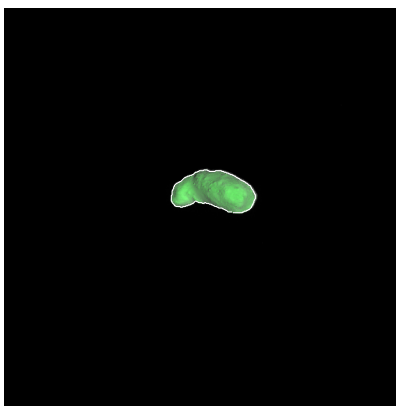


Figure 8: ST_2368576832_v.fits

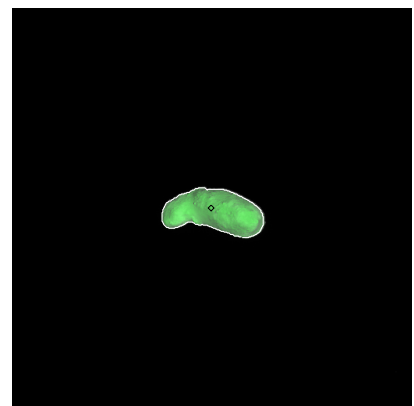


Figure 9: ST_2370315564_b.fits

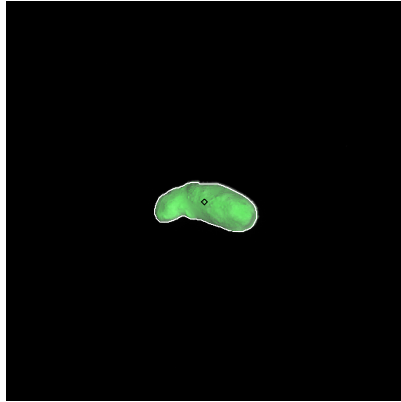


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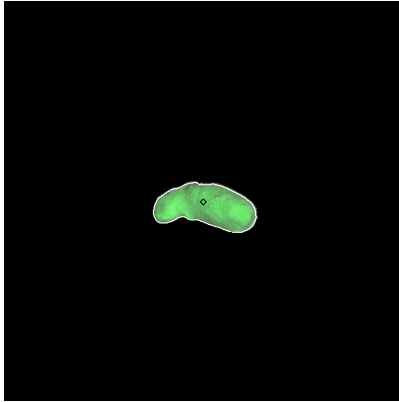


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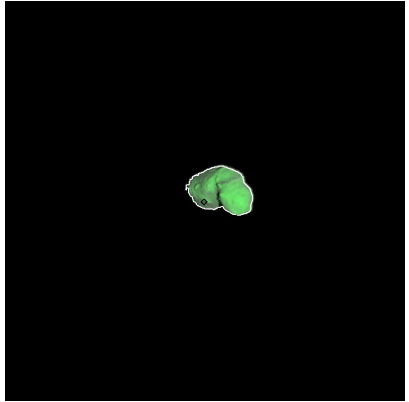


Figure 12:
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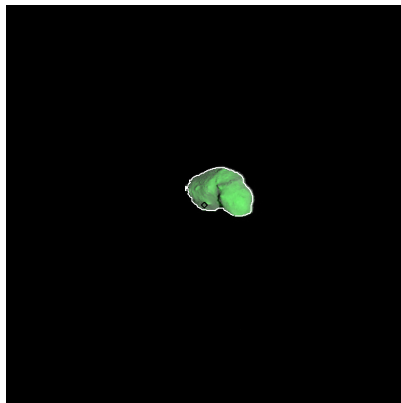


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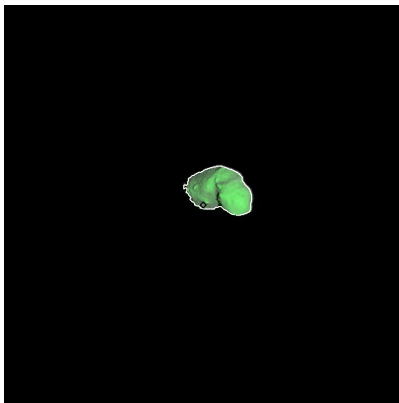


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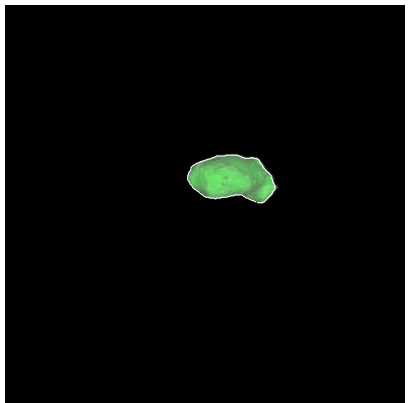


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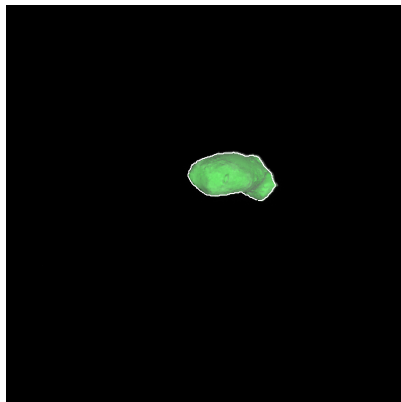


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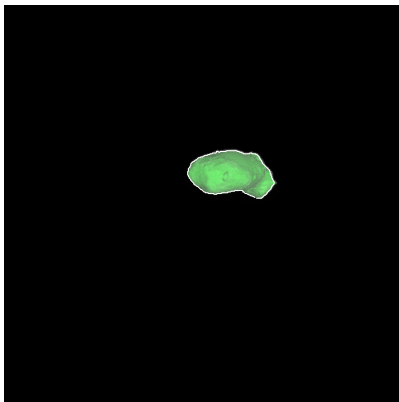


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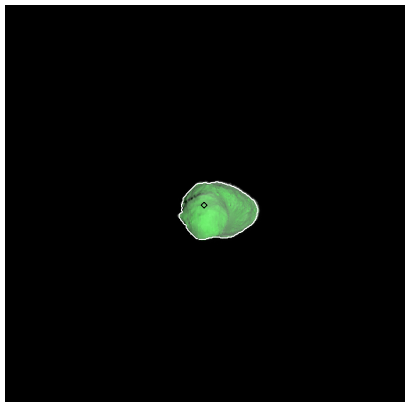


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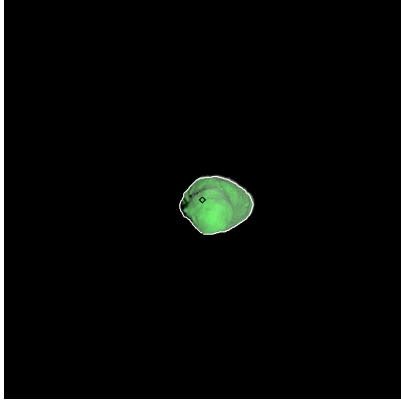


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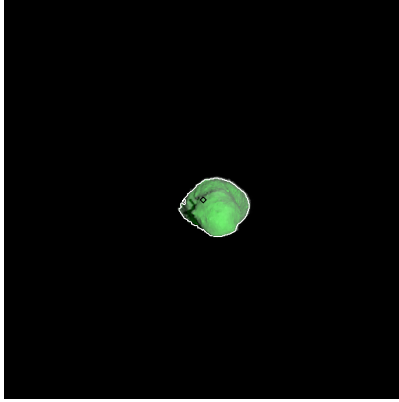


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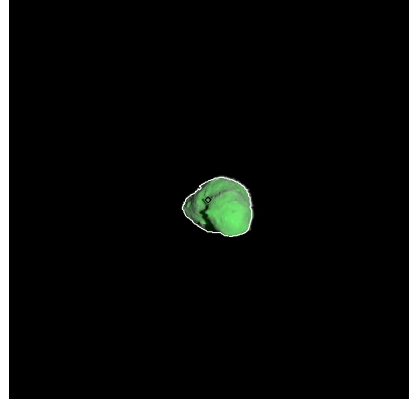


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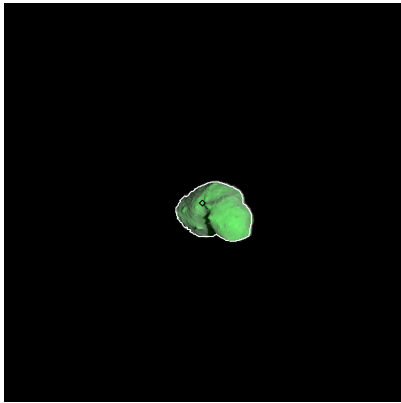


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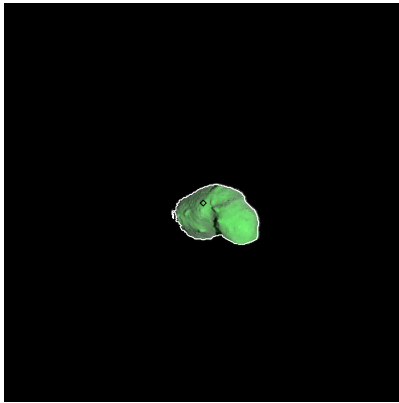


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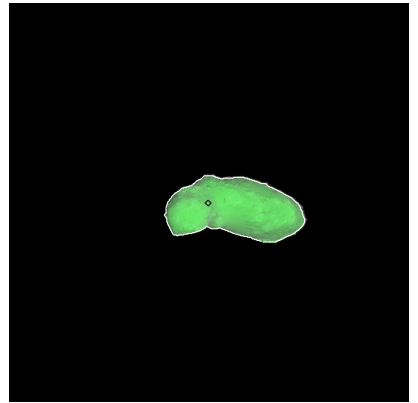


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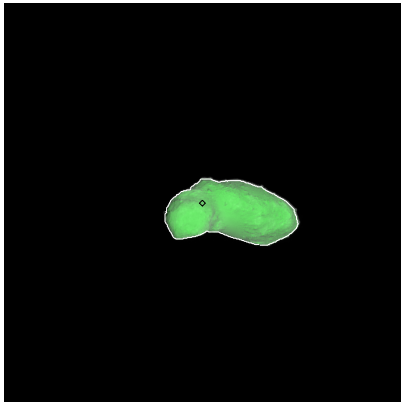


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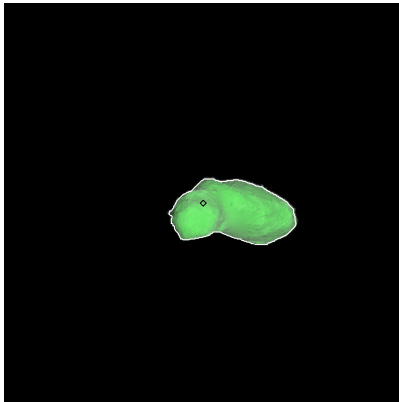


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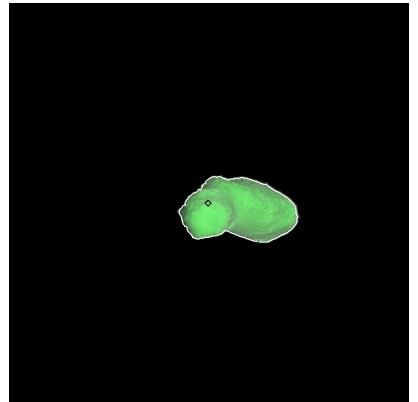


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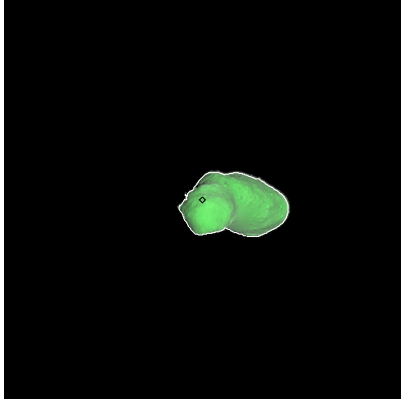


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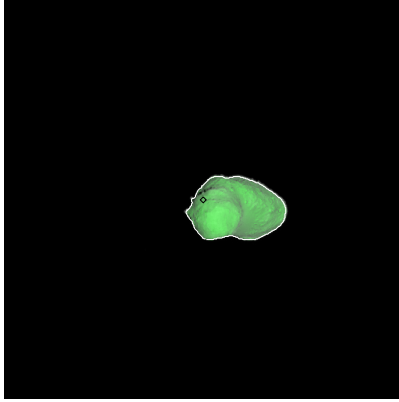


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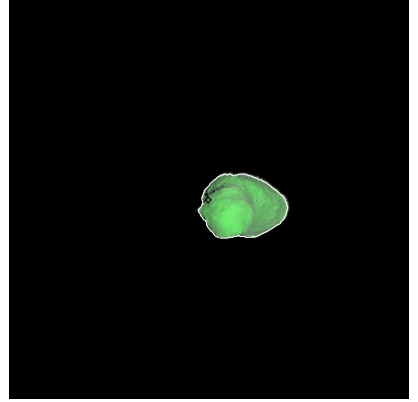


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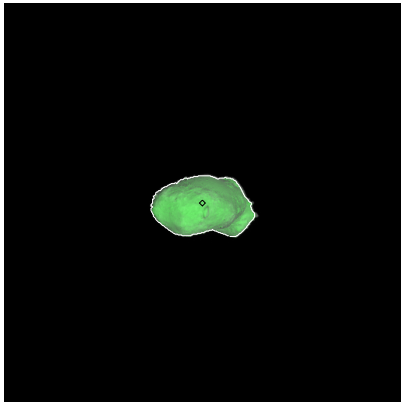


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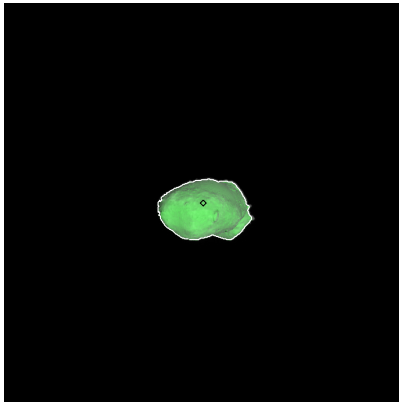


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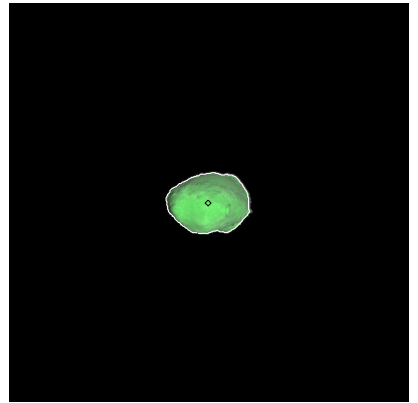


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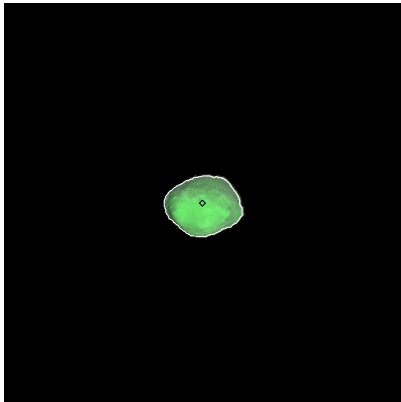


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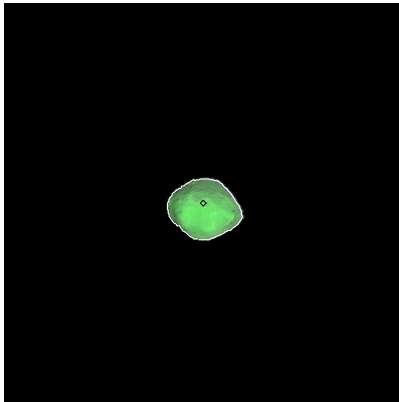


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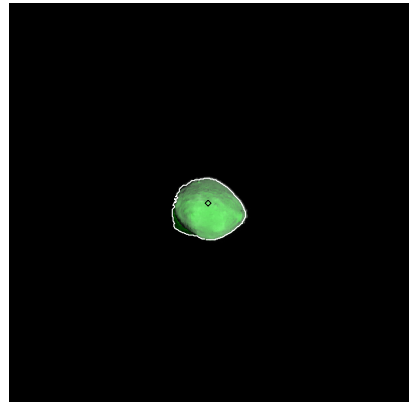


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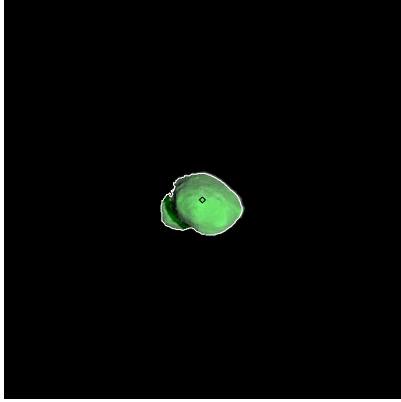


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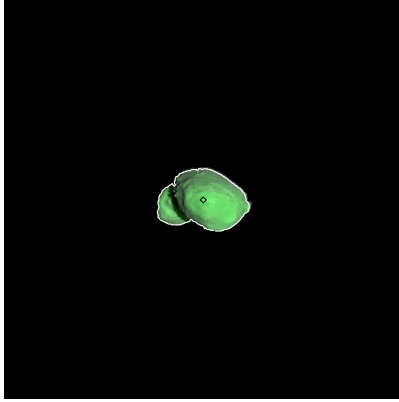


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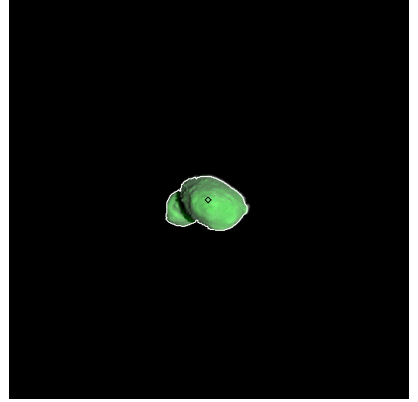


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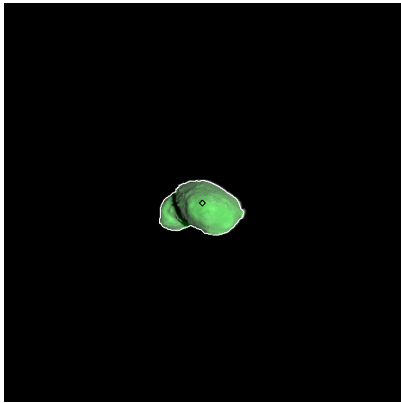


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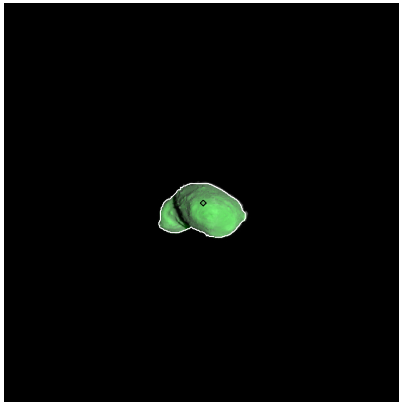


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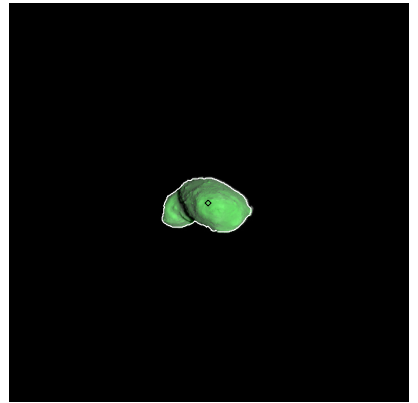


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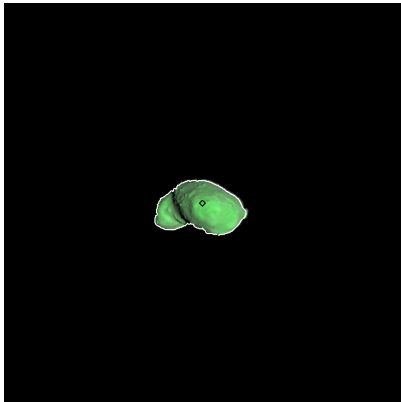


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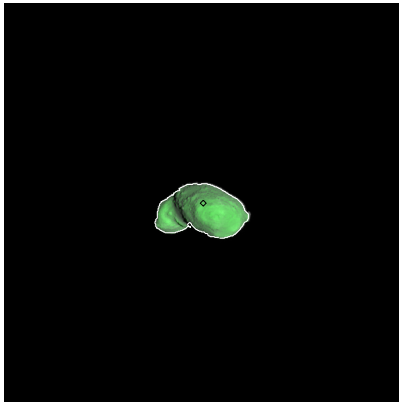


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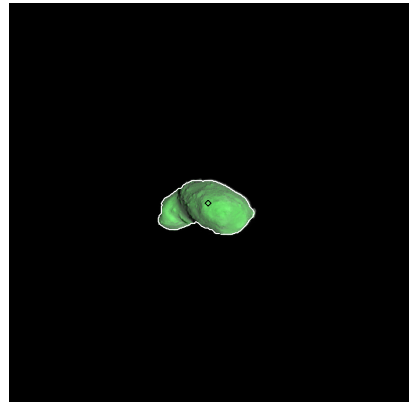


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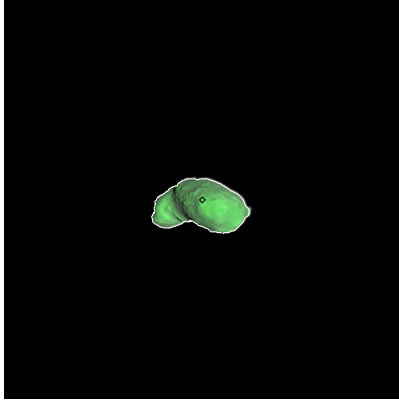


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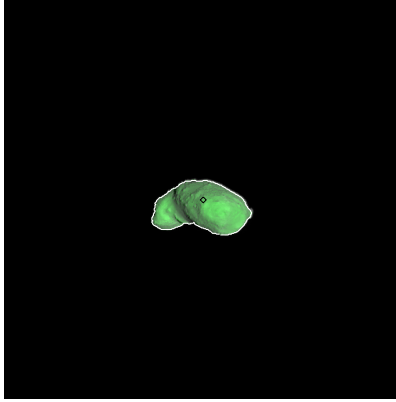


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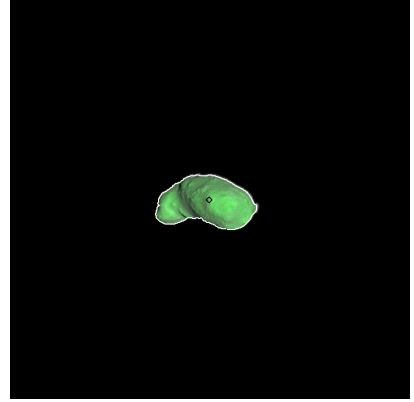


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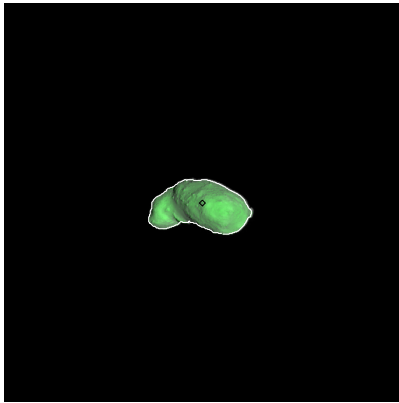


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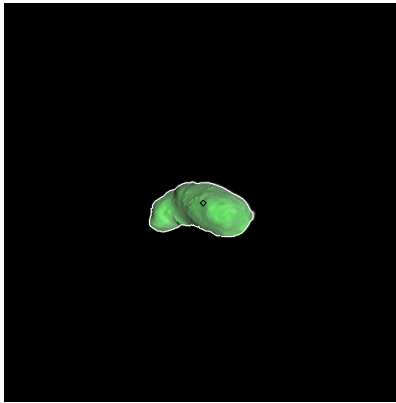


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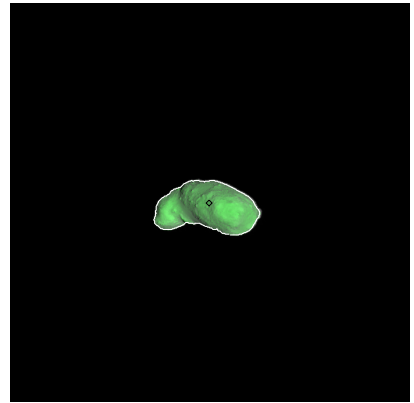


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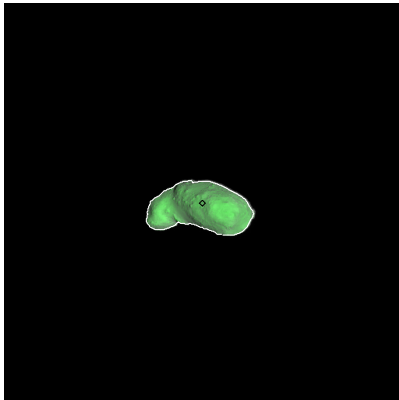


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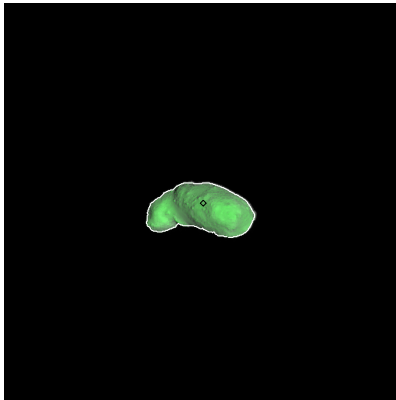


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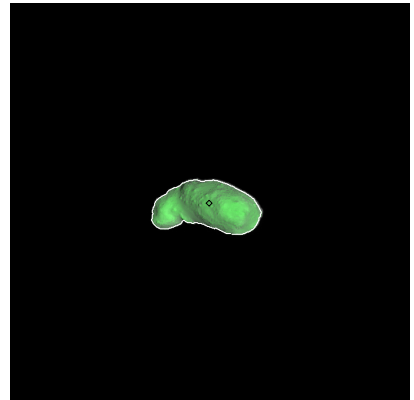


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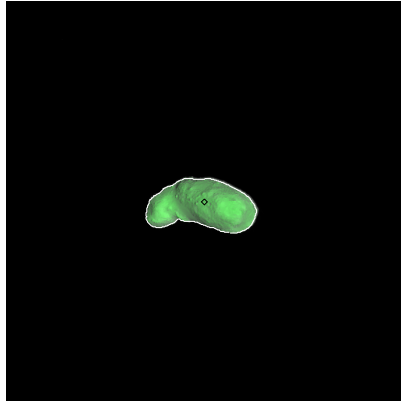


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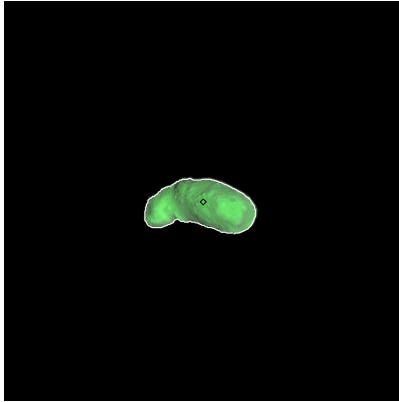


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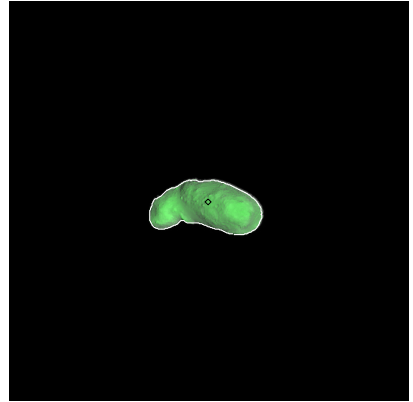


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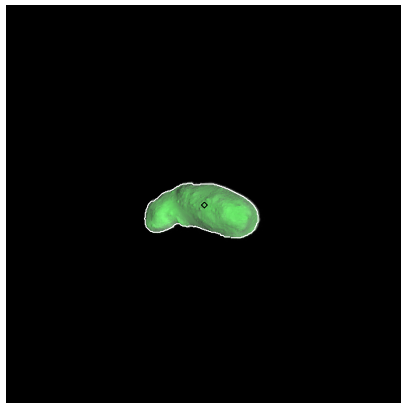


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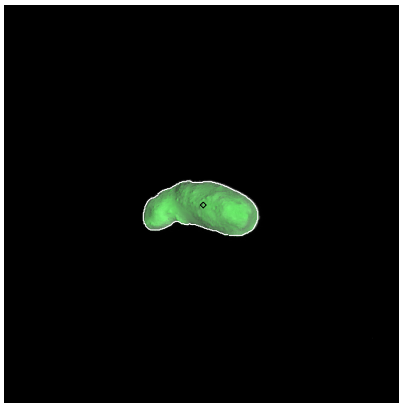


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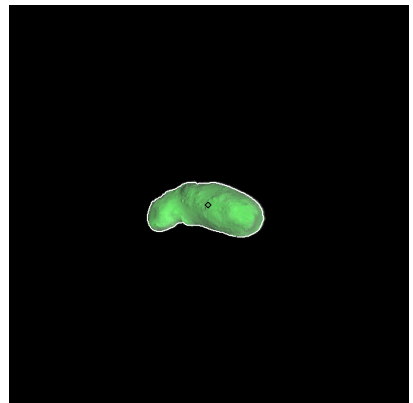


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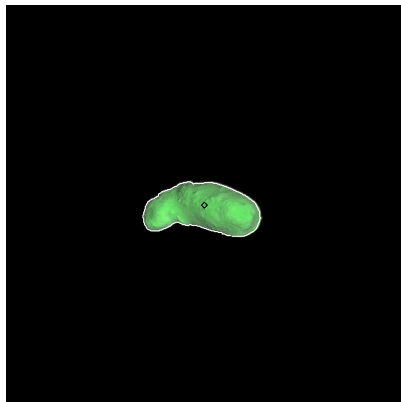


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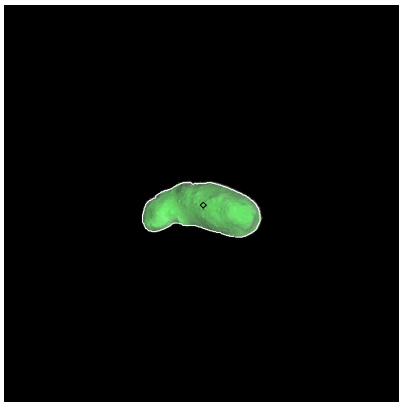


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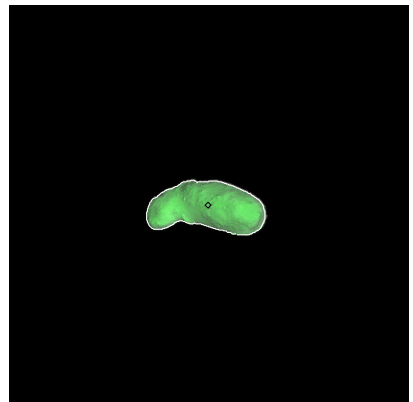


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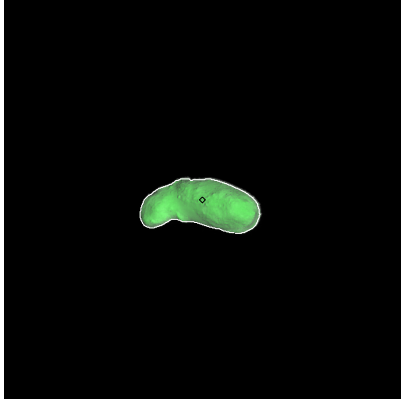


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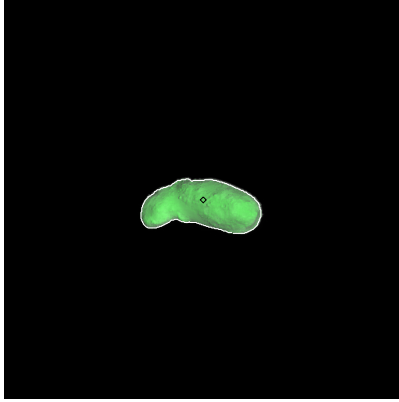


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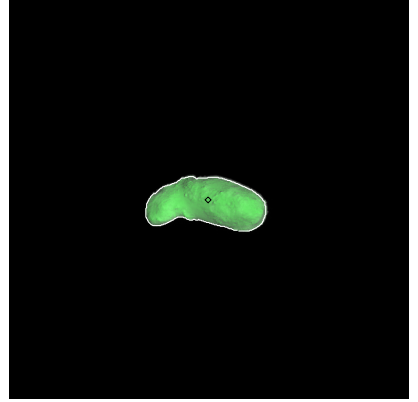


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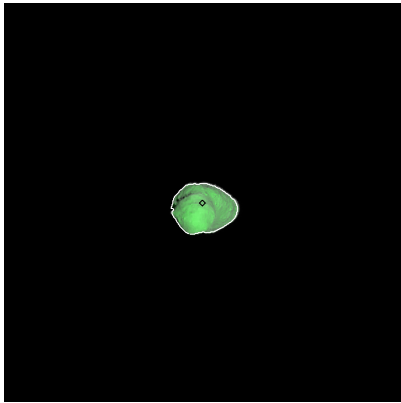


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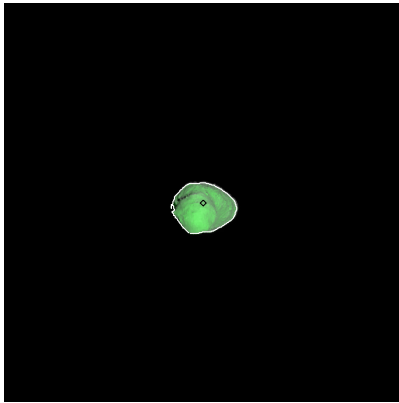


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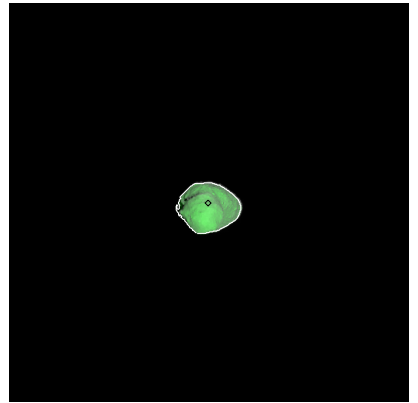


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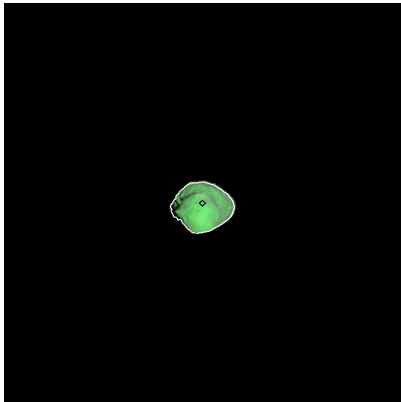


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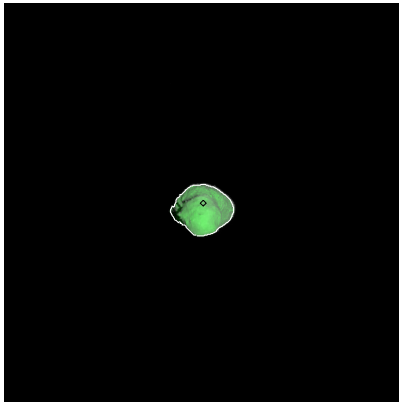


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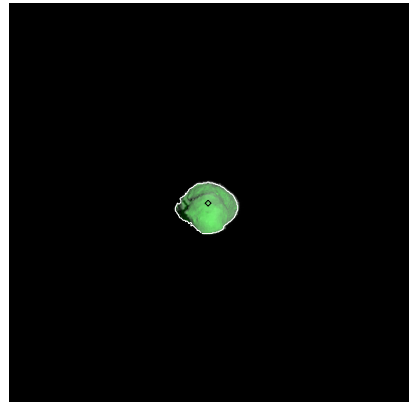


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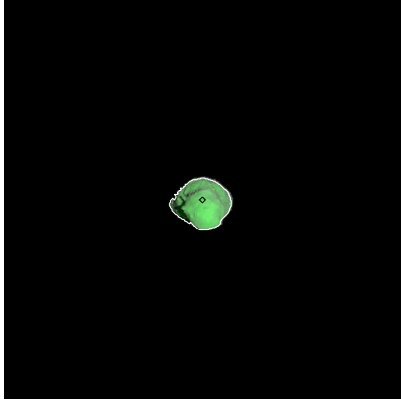


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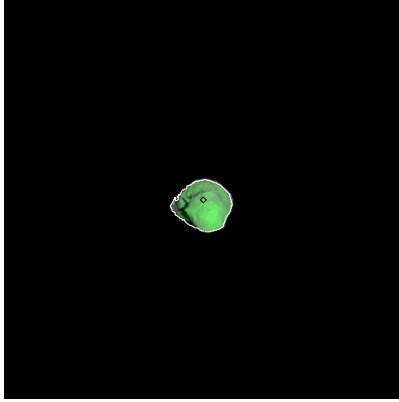


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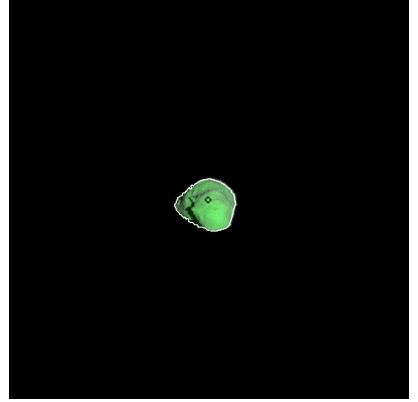


Figure 75:
ST_2395561149_v.fits

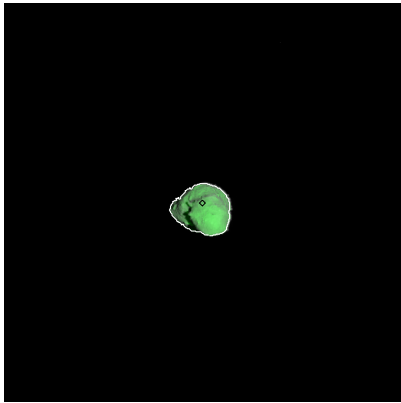


Figure 76:
ST_2395568834_v.fits

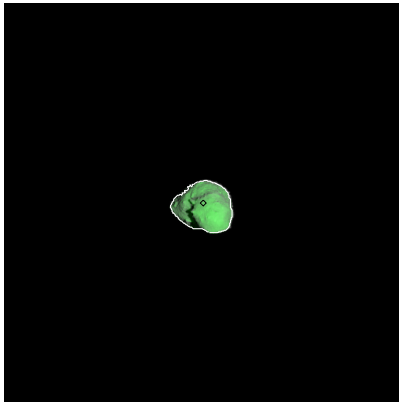


Figure 77:
ST_2395576519_v.fits

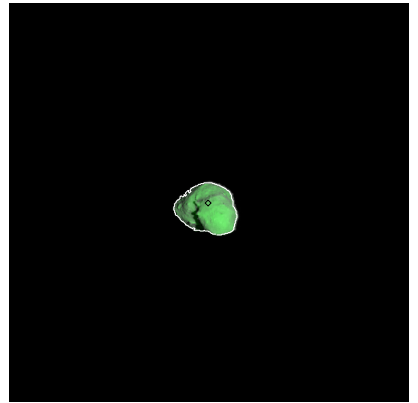


Figure 78:
ST_2395584204_v.fits

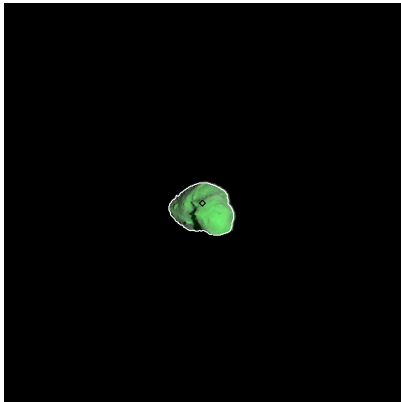


Figure 79:
ST_2395591873_v.fits

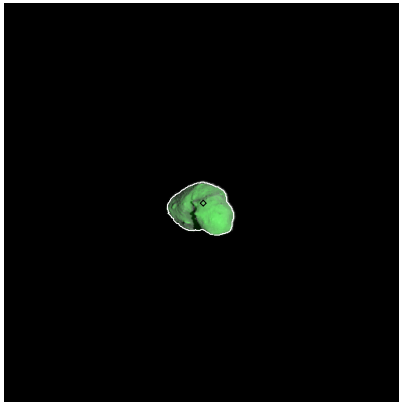


Figure 80:
ST_2395599557_v.fits

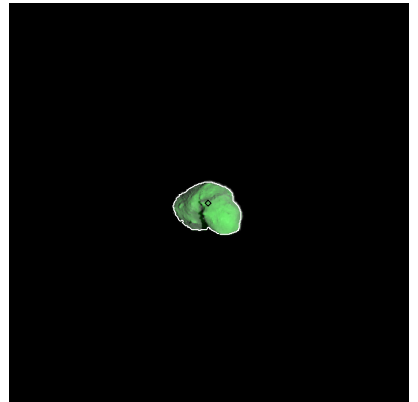


Figure 81:
ST_2395607242_v.fits

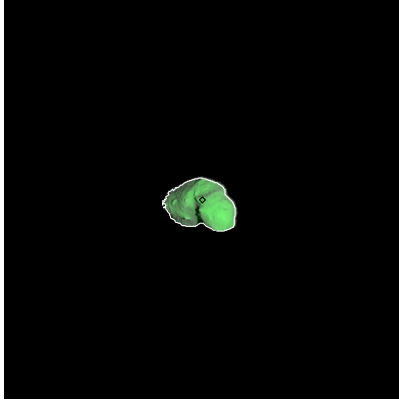


Figure 82:
ST_2395622594_v.fits

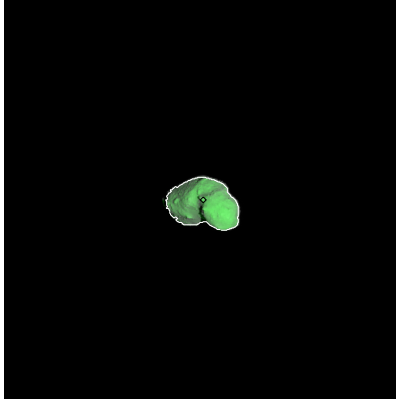


Figure 83:
ST_2395630278_v.fits

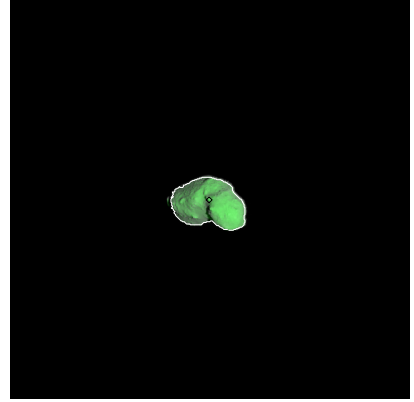


Figure 84:
ST_2395637963_v.fits

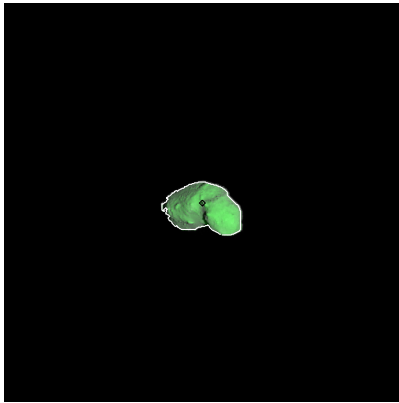


Figure 85:
ST_2395645632_v.fits

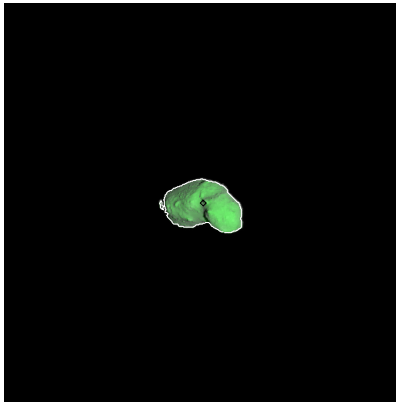


Figure 86:
ST_2395653317_v.fits

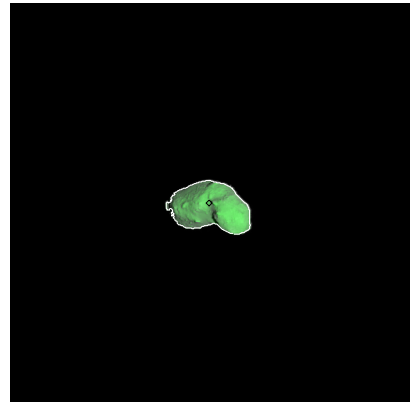


Figure 87:
ST_2395661002_v.fits

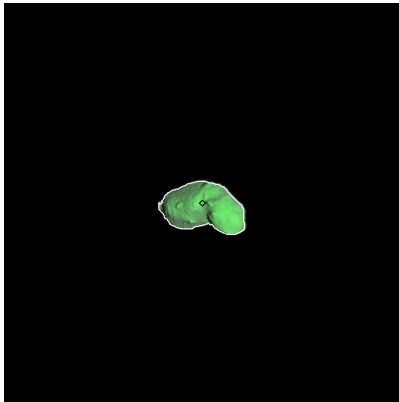


Figure 88:
ST_2395668687_v.fits

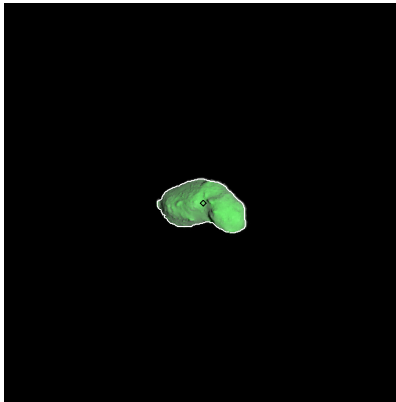


Figure 89:
ST_2395676355_v.fits

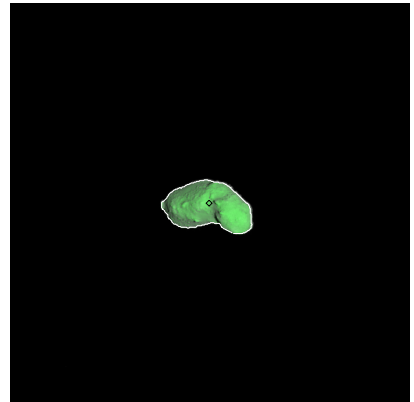


Figure 90:
ST_2395684040_v.fits

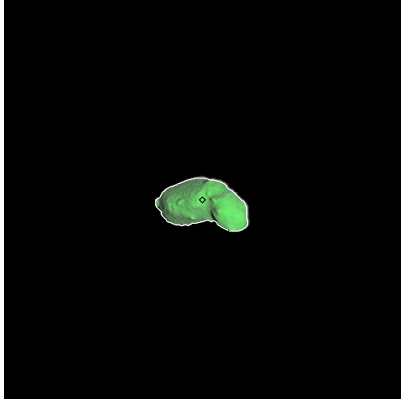


Figure 91:
ST_2395691725_v.fits

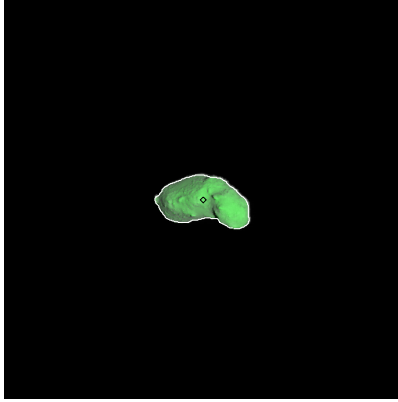


Figure 92:
ST_2395699394_v.fits

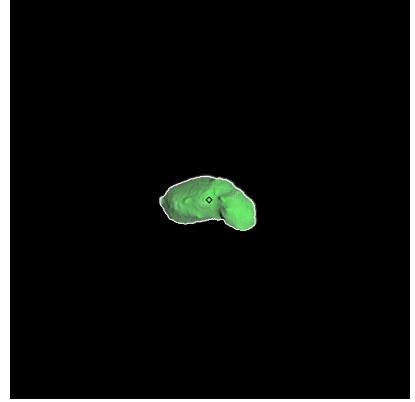


Figure 93:
ST_2395707079_v.fits

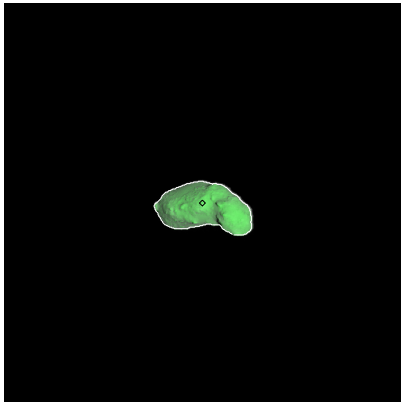


Figure 94:
ST_2395714764_v.fits

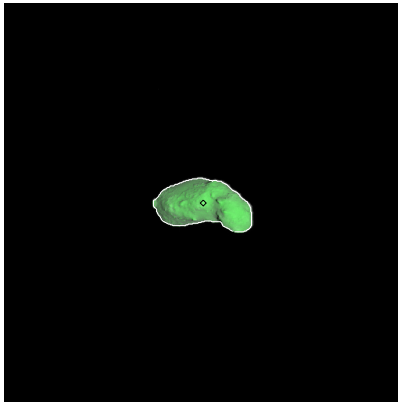


Figure 95:
ST_2395722449_v.fits

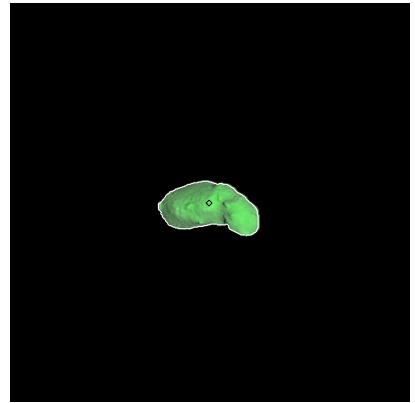


Figure 96:
ST_2395730117_v.fits

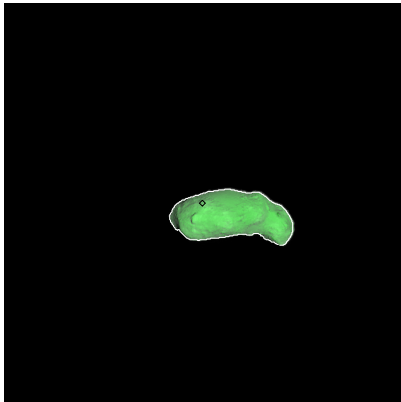


Figure 97:
ST_2402929709_v.fits

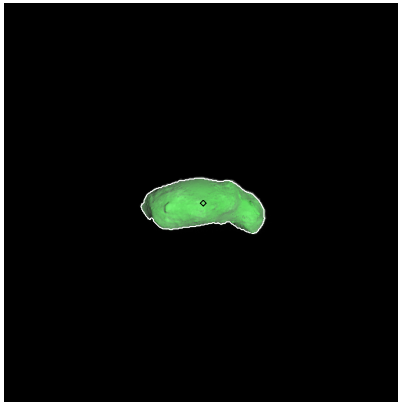


Figure 98:
ST_2402939306_v.fits

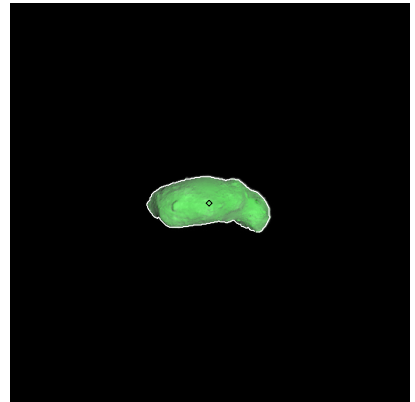


Figure 99:
ST_2402948904_v.fits

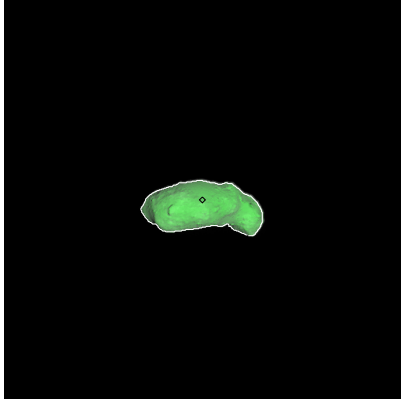


Figure 100:
ST_2402958501_v.fits

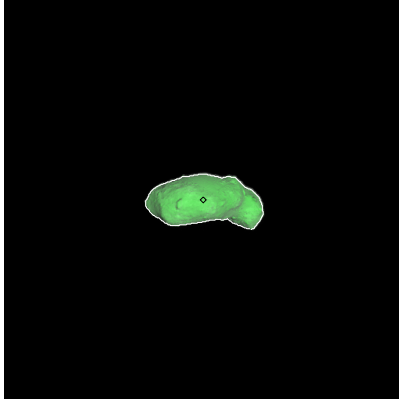


Figure 101:
ST_2402987304_v.fits

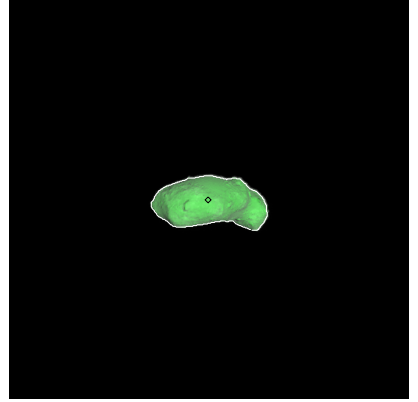


Figure 102:
ST_2402996901_v.fits

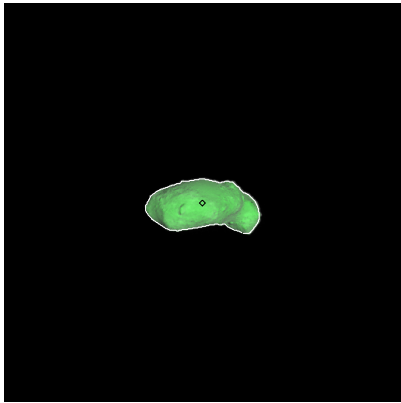


Figure 103:
ST_2403006498_v.fits

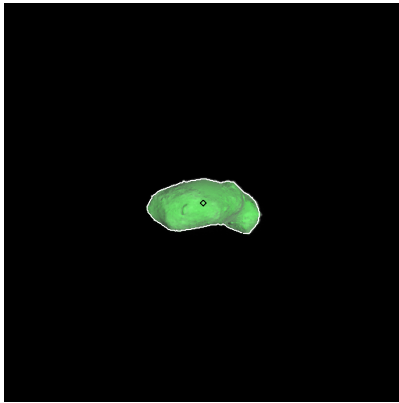


Figure 104:
ST_2403016095_v.fits

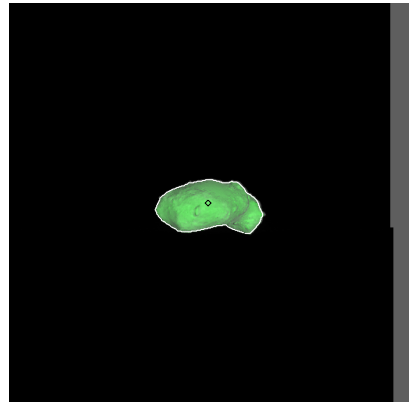


Figure 105:
ST_2403044899_v.fits

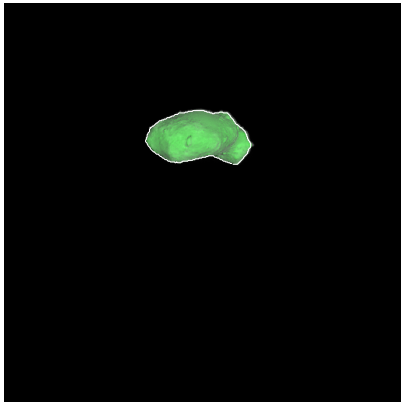


Figure 106:
ST_2403054496_v.fits

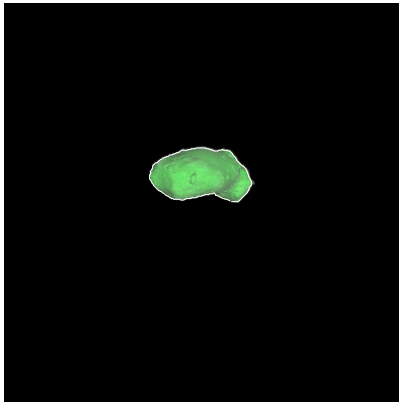


Figure 107:
ST_2403064093_v.fits

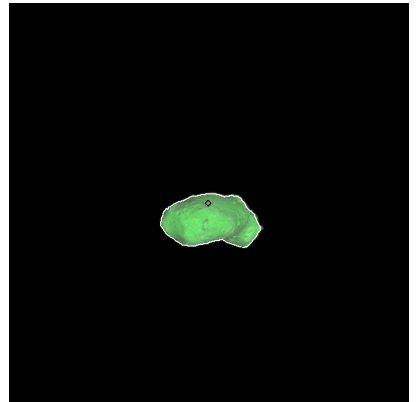


Figure 108:
ST_2403073707_v.fits

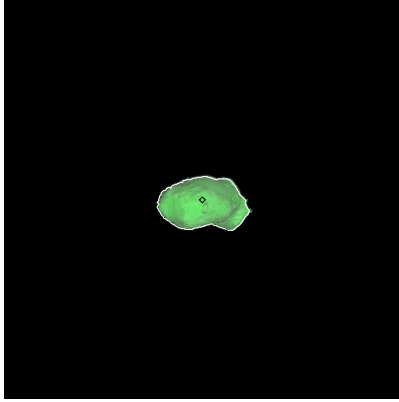


Figure 109:
ST_2403102494_v.fits

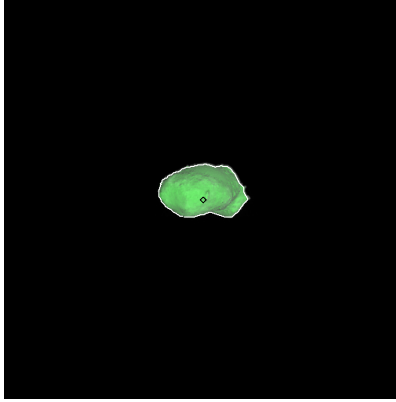


Figure 110:
ST_2403112092_v.fits

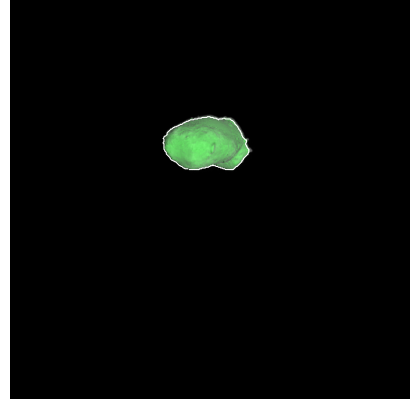


Figure 111:
ST_2403121689_v.fits

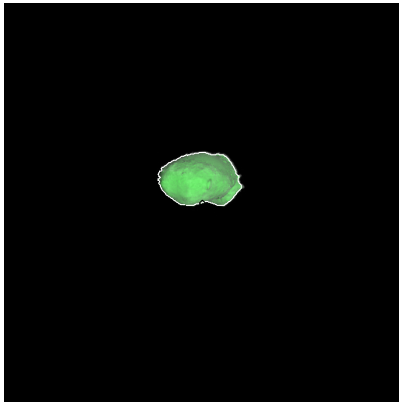


Figure 112:
ST_2403131303_v.fits

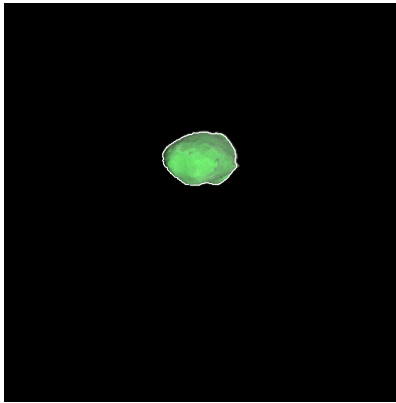


Figure 113:
ST_2403160106_v.fits

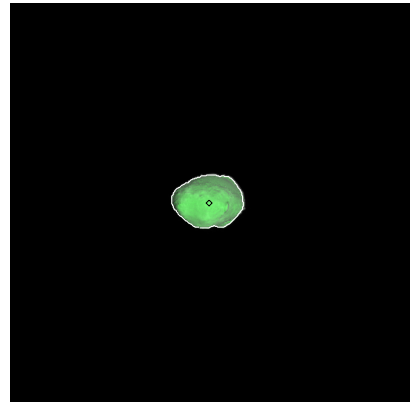


Figure 114:
ST_2403169687_v.fits

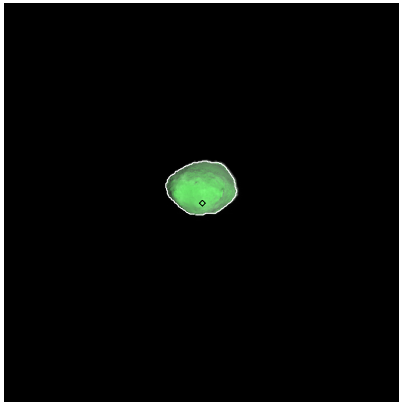


Figure 115:
ST_2403179301_v.fits

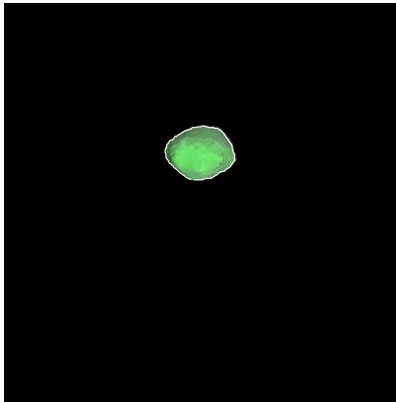


Figure 116:
ST_2403188898_v.fits

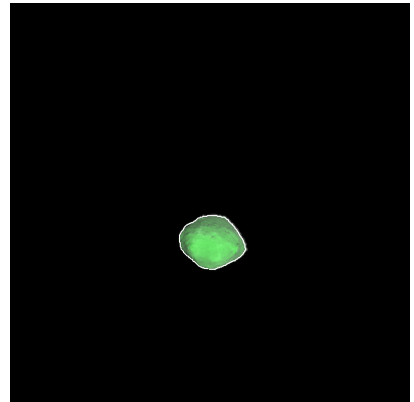


Figure 117:
ST_2403217686_v.fits

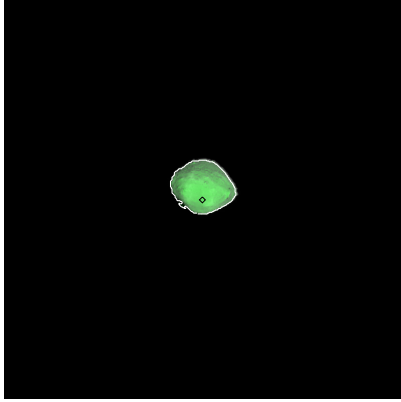


Figure 118:
ST_2403227299_v.fits

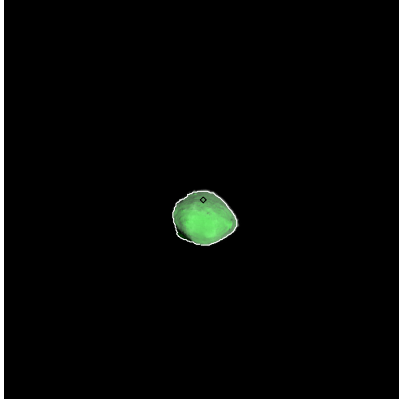


Figure 119:
ST_2403236896_v.fits

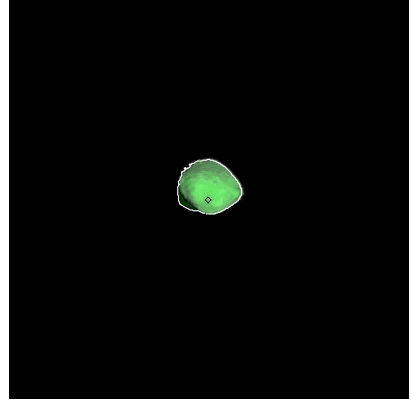


Figure 120:
ST_2403246494_v.fits

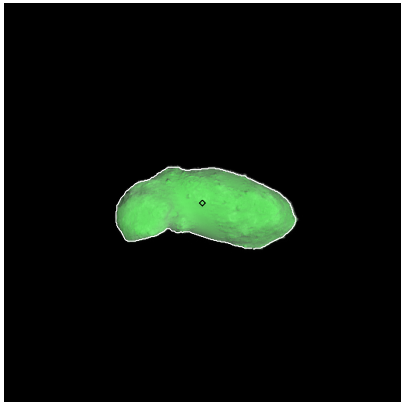


Figure 121:
ST_2409239615_v.fits

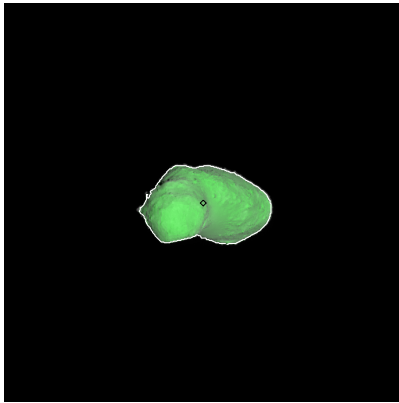


Figure 122:
ST_2409393181_v.fits

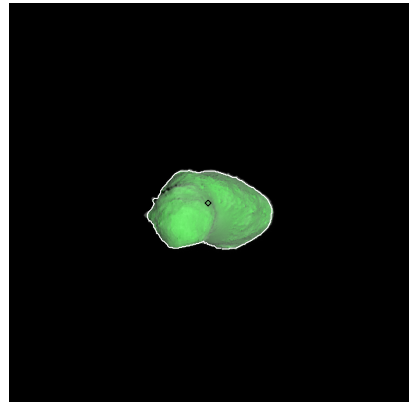


Figure 123:
ST_2409408532_v.fits

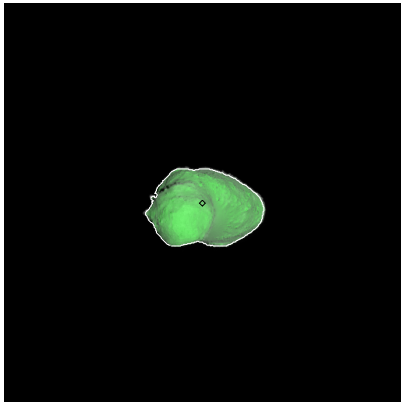


Figure 124:
ST_2409423899_v.fits

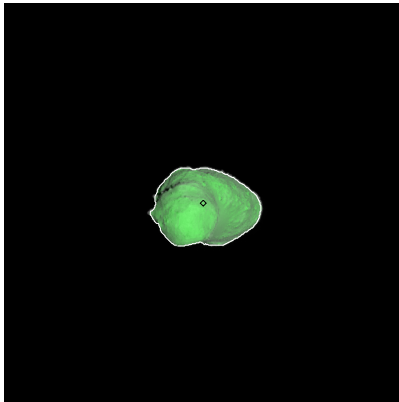


Figure 125:
ST_2409439250_v.fits

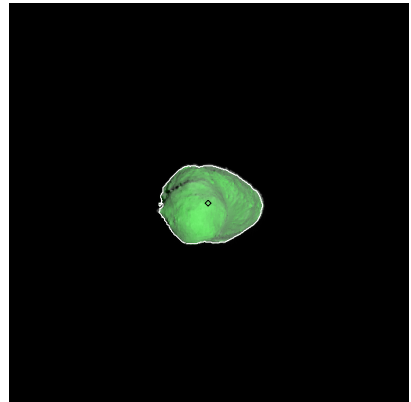


Figure 126:
ST_2409454601_v.fits

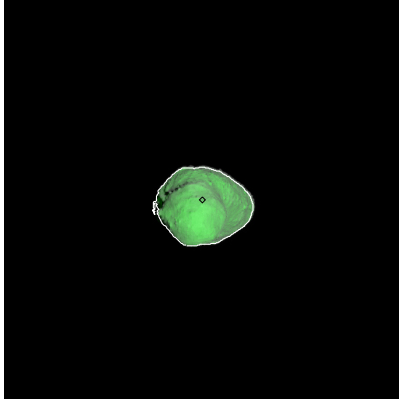


Figure 127:
ST_2409469968_v.fits

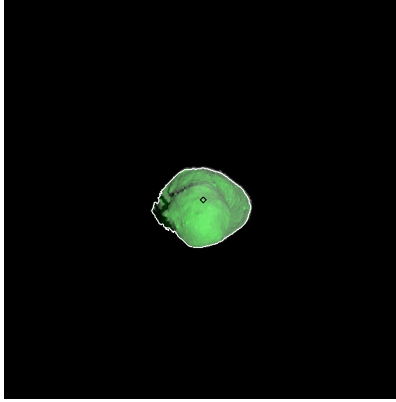


Figure 128:
ST_2409485319_v.fits

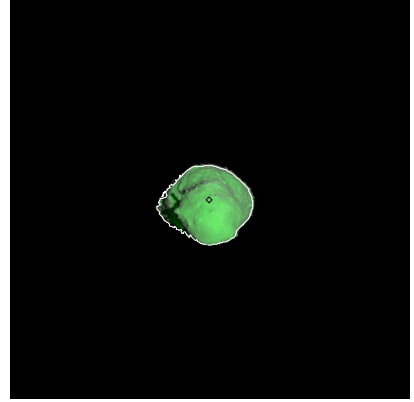


Figure 129:
ST_2409500687_v.fits

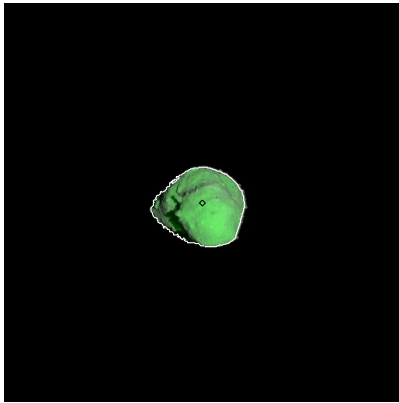


Figure 130:
ST_2409516054_v.fits

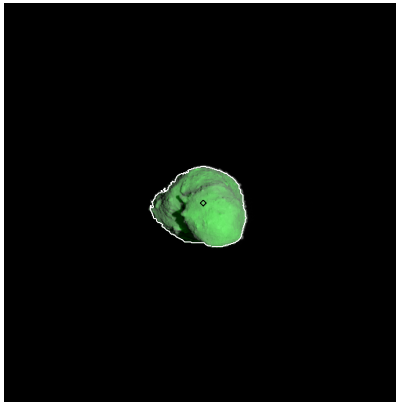


Figure 131:
ST_2409531405_v.fits

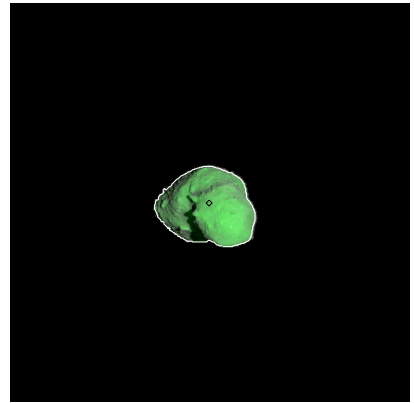


Figure 132:
ST_2409546772_v.fits

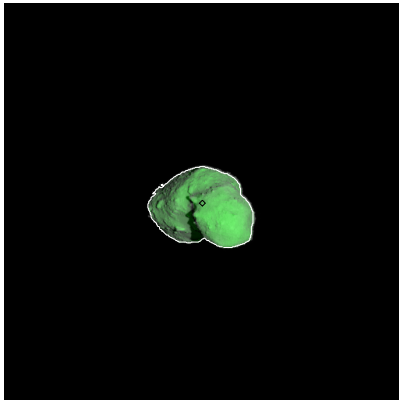


Figure 133:
ST_2409562123_v.fits

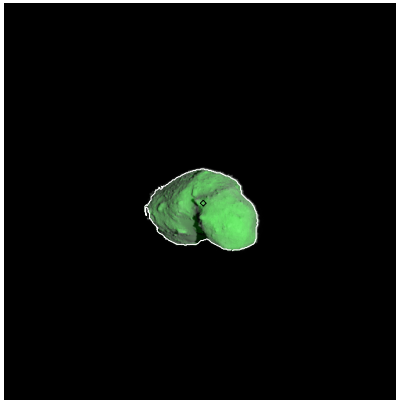


Figure 134:
ST_2409577490_v.fits

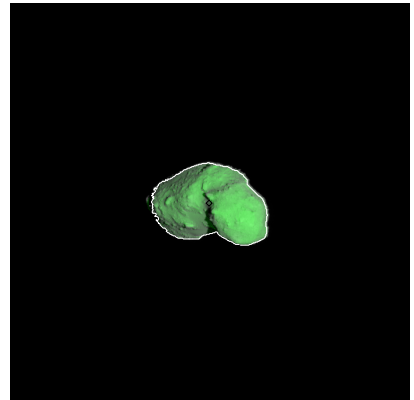


Figure 135:
ST_2409592857_v.fits

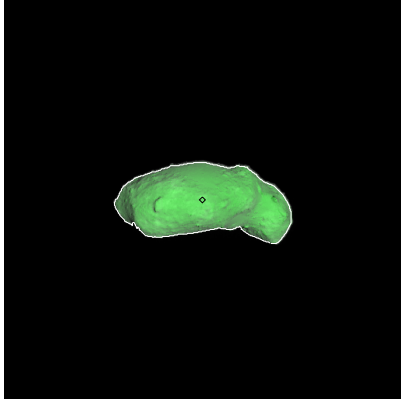


Figure 136:
ST_2409938528_v.fits

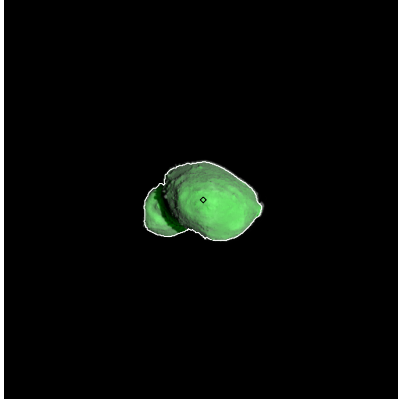


Figure 137:
ST_2410284102_v.fits

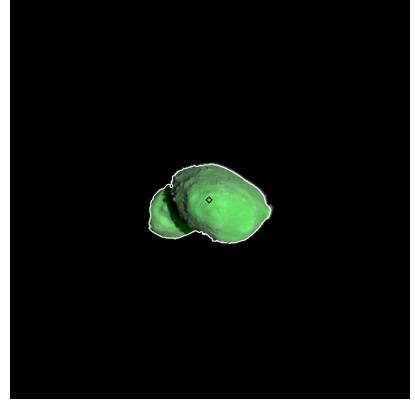


Figure 138:
ST_2410291803_v.fits

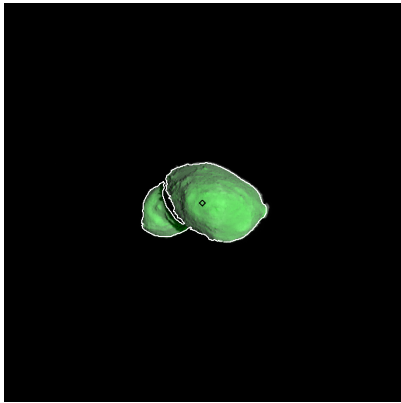


Figure 139:
ST_2410299472_v.fits

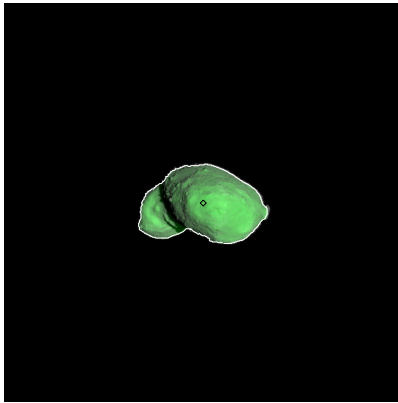


Figure 140:
ST_2410307157_v.fits

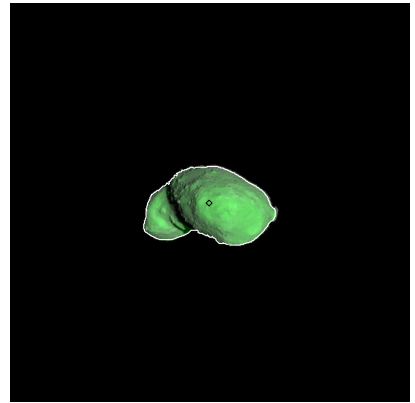


Figure 141:
ST_2410314842_v.fits

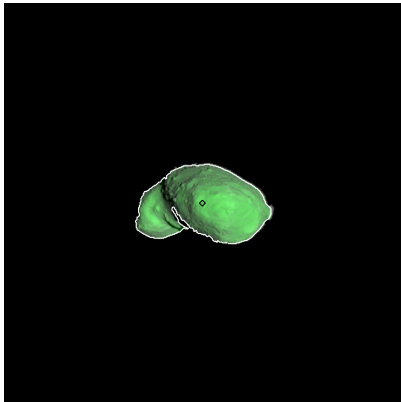


Figure 142:
ST_2410322510_v.fits

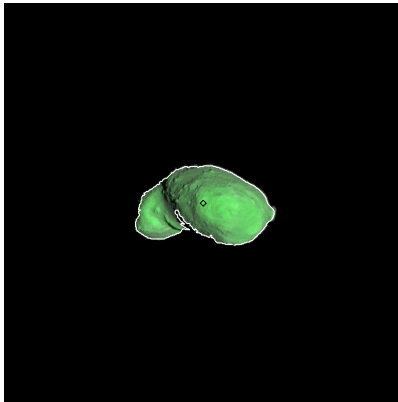


Figure 143:
ST_2410330195_v.fits

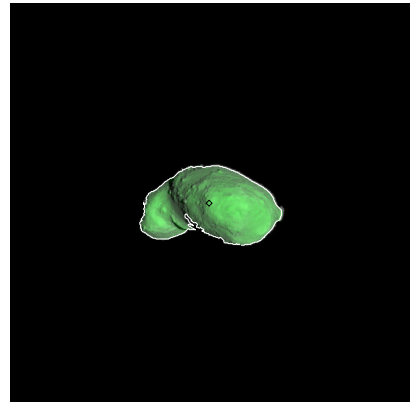


Figure 144:
ST_2410337880_v.fits

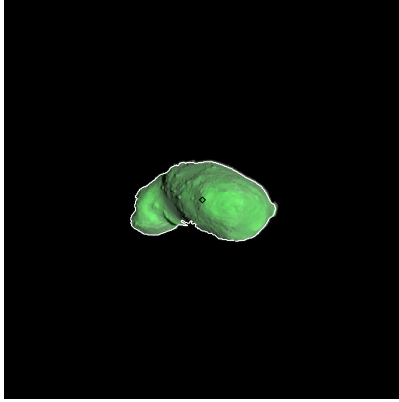


Figure 145:
ST_2410345549_v.fits

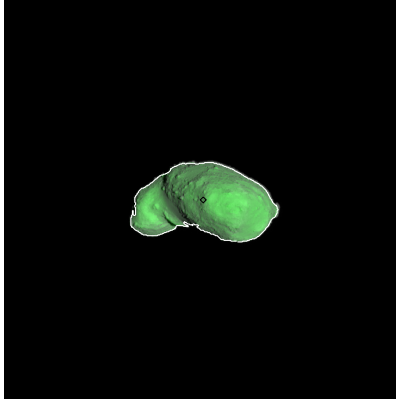


Figure 146:
ST_2410353234_v.fits

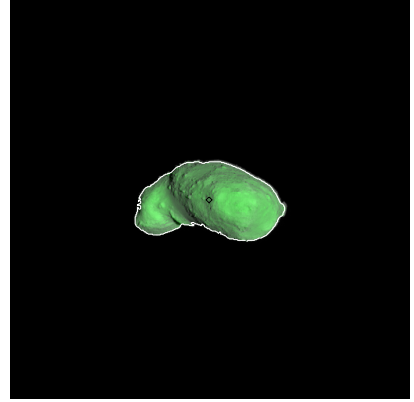


Figure 147:
ST_2410360919_v.fits

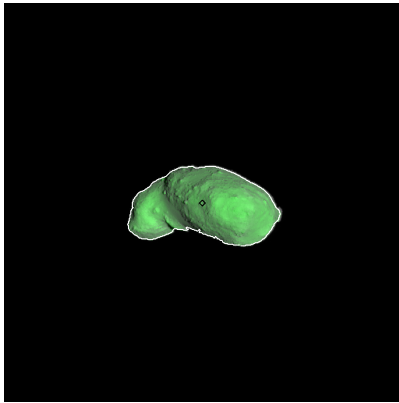


Figure 148:
ST_2410368604_v.fits

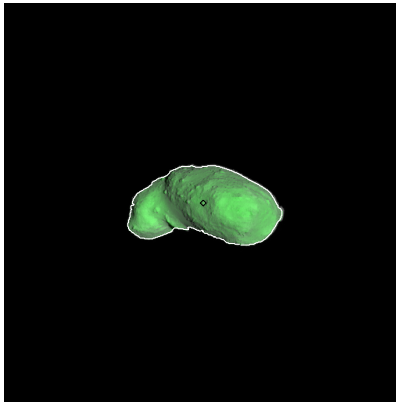


Figure 149:
ST_2410376289_v.fits

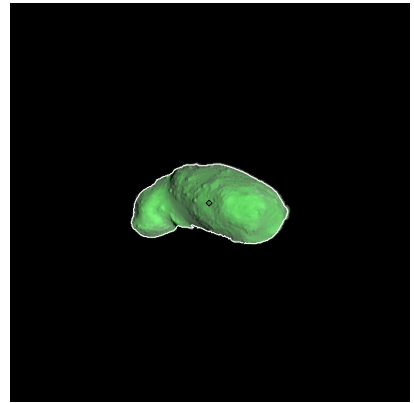


Figure 150:
ST_2410383958_v.fits

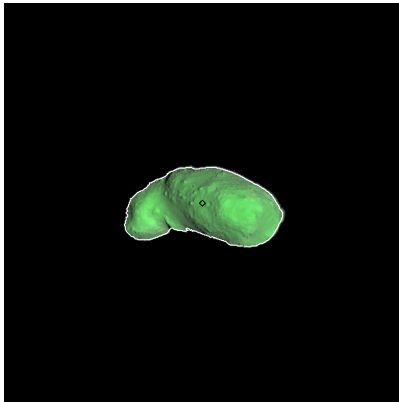


Figure 151:
ST_2410391643_v.fits

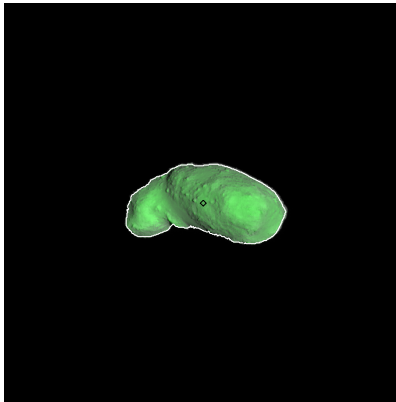


Figure 152:
ST_2410399311_v.fits

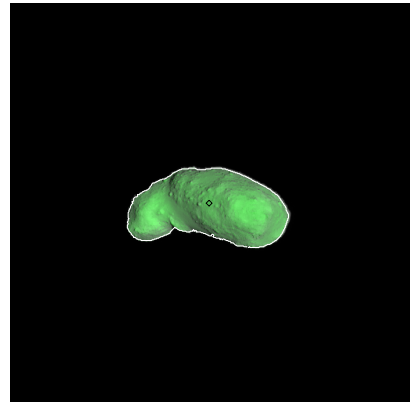


Figure 153:
ST_2410406996_v.fits

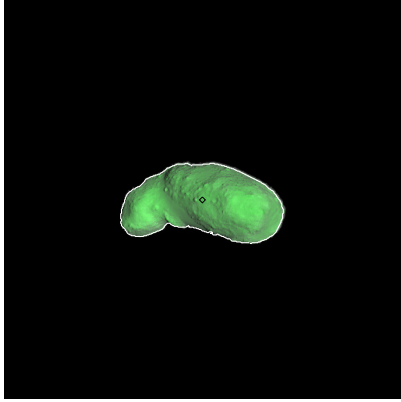


Figure 154:
ST_2410414682_v.fits



Figure 155:
ST_2412035188_v.fits

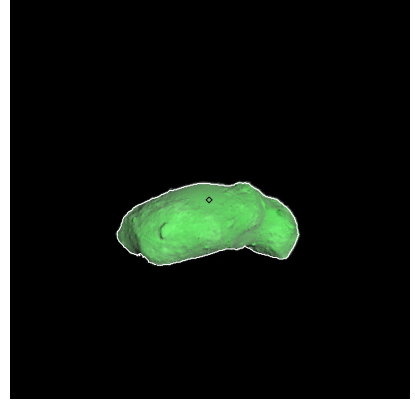


Figure 156:
ST_2412734079_v.fits

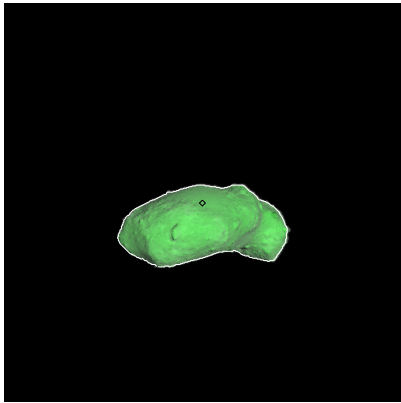


Figure 157:
ST_2412780159_v.fits

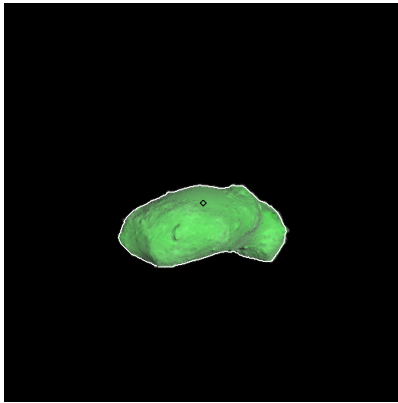


Figure 158:
ST_2412787844_v.fits

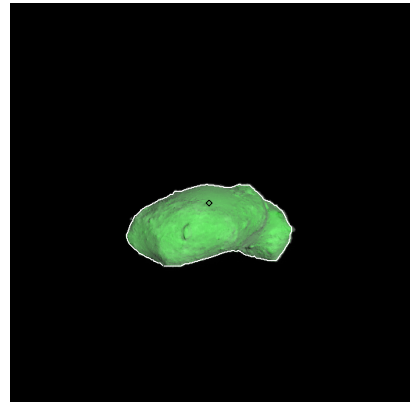


Figure 159:
ST_2412795529_v.fits

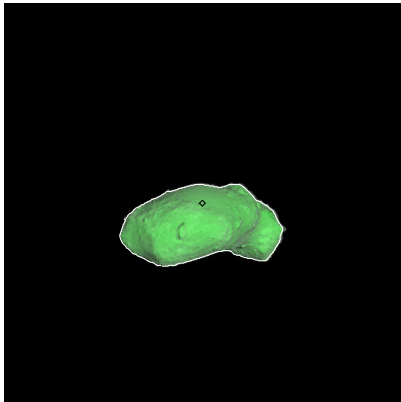


Figure 160:
ST_2412803198_v.fits

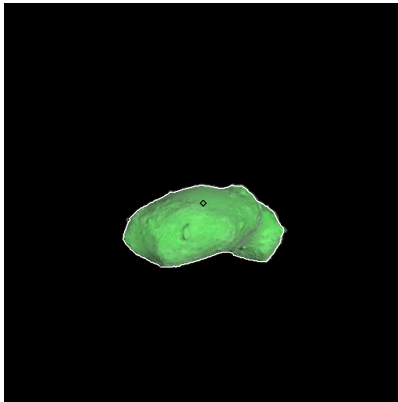


Figure 161:
ST_2412810883_v.fits

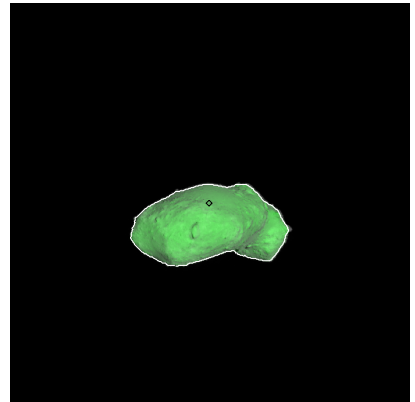


Figure 162:
ST_2412818567_v.fits

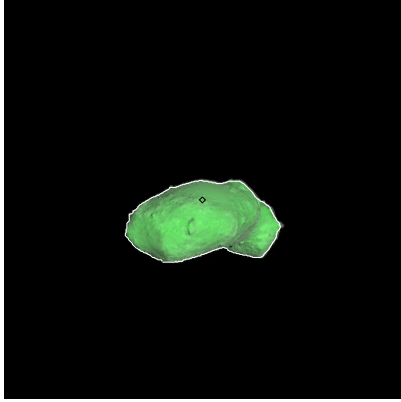


Figure 163:
ST_2412826236_v.fits

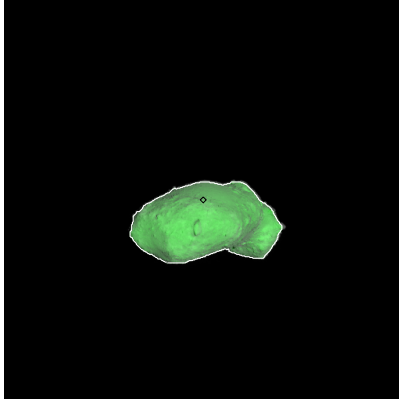


Figure 164:
ST_2412833921_v.fits

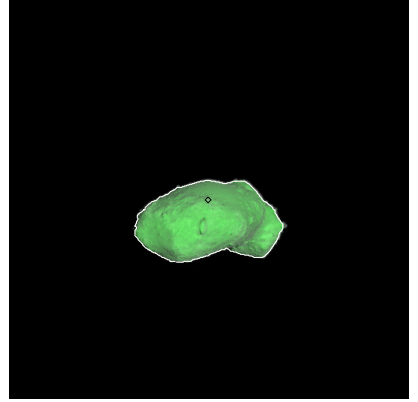


Figure 165:
ST_2412841606_v.fits

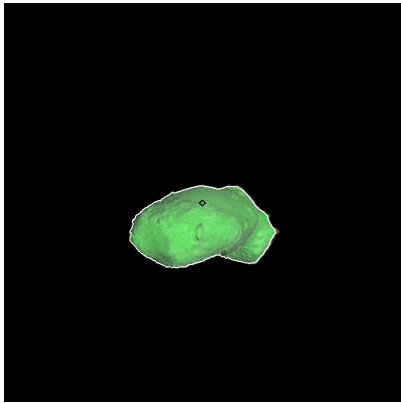


Figure 166:
ST_2412849275_v.fits

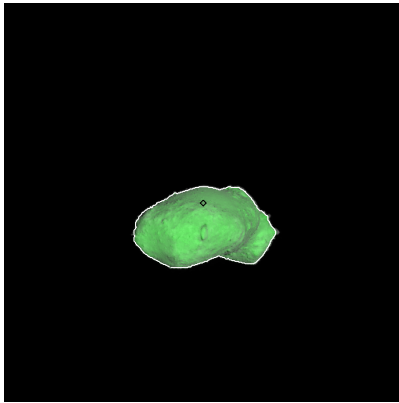


Figure 167:
ST_2412856960_v.fits

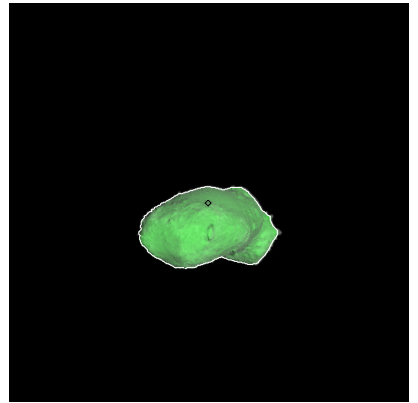


Figure 168:
ST_2412864645_v.fits

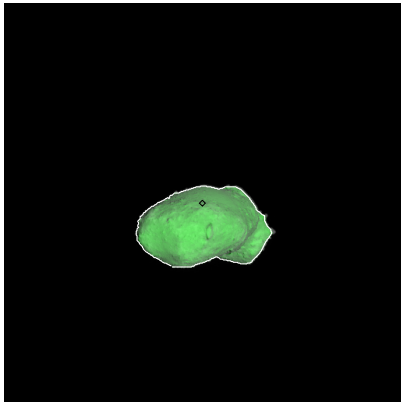


Figure 169:
ST_2412872313_v.fits

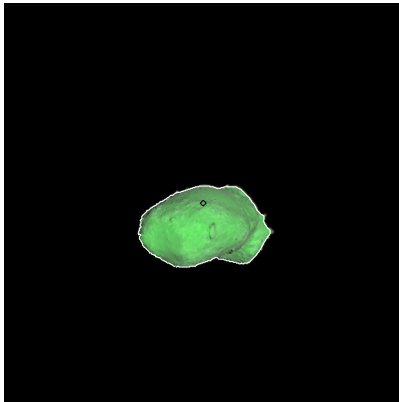


Figure 170:
ST_2412879998_v.fits

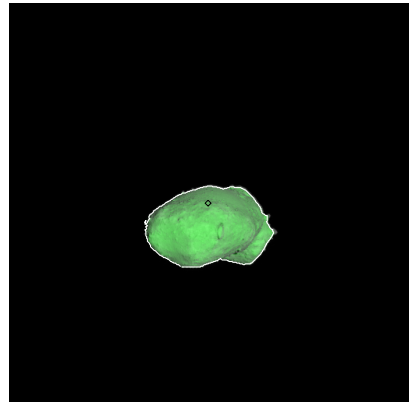


Figure 171:
ST_2412887667_v.fits

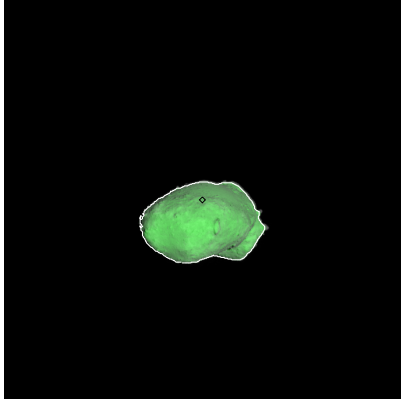


Figure 172:
ST_2412895352_v.fits

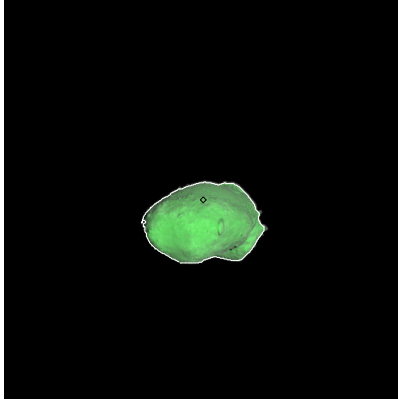


Figure 173:
ST_2412903037_v.fits

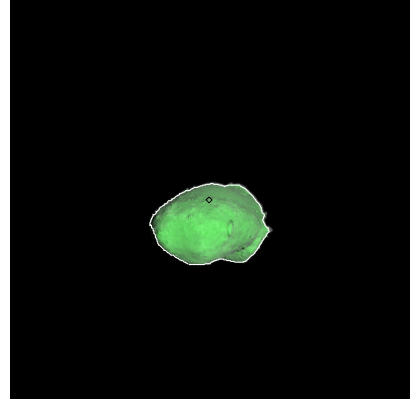


Figure 174:
ST_2412910705_v.fits

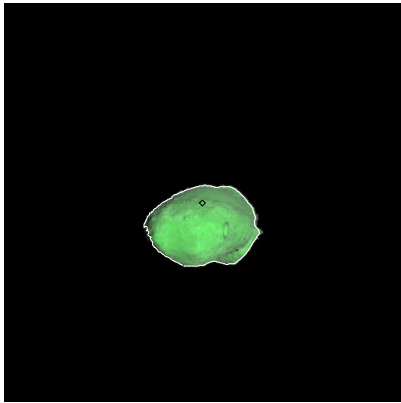


Figure 175:
ST_2412918390_v.fits

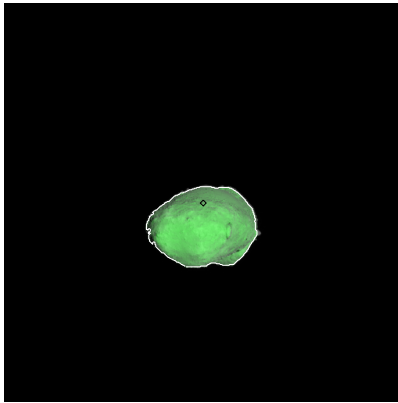


Figure 176:
ST_2412926075_v.fits

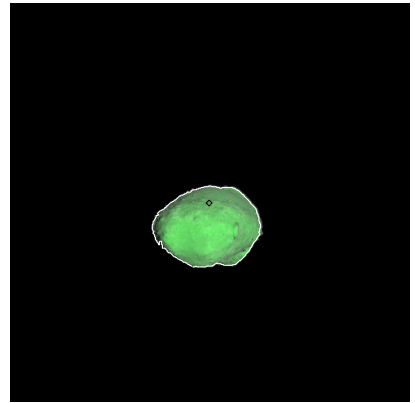


Figure 177:
ST_2412933744_v.fits

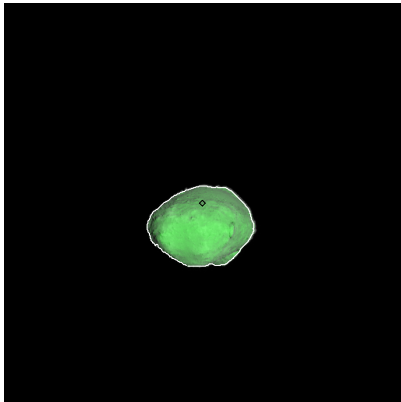


Figure 178:
ST_2412941429_v.fits

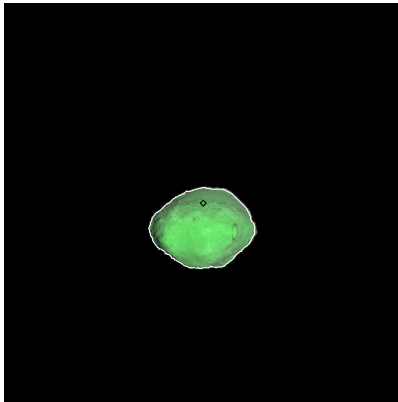


Figure 179:
ST_2412949114_v.fits

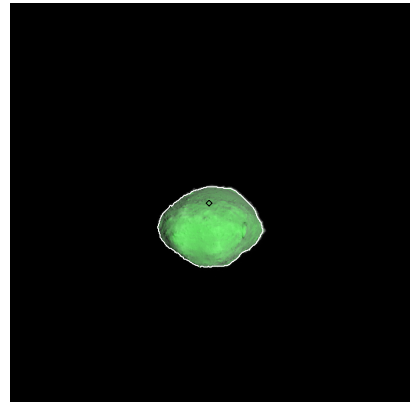


Figure 180:
ST_2412956782_v.fits

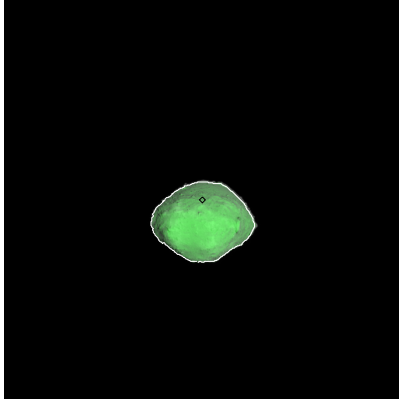


Figure 181:
ST_2412964467_v.fits

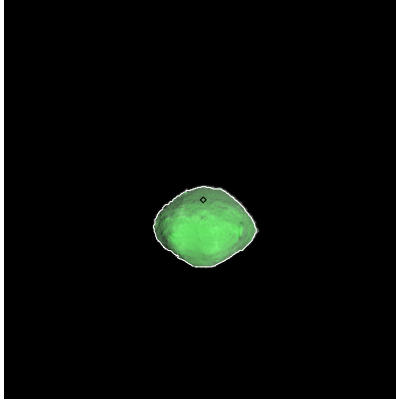


Figure 182:
ST_2412972136_v.fits

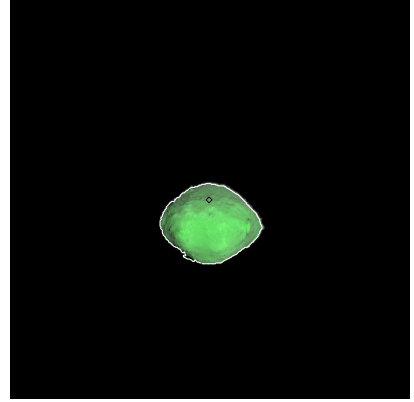


Figure 183:
ST_2412979821_v.fits

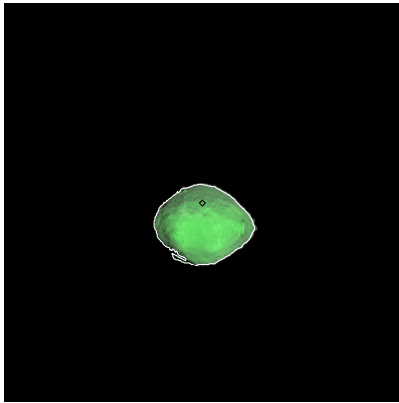


Figure 184:
ST_2412987506_v.fits

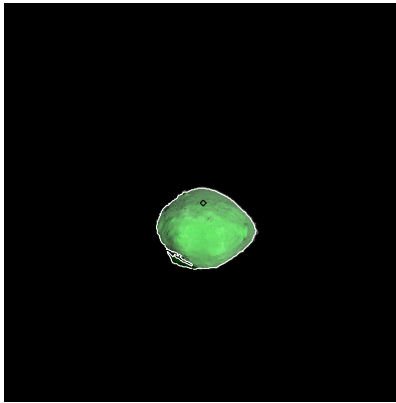


Figure 185:
ST_2412995191_v.fits

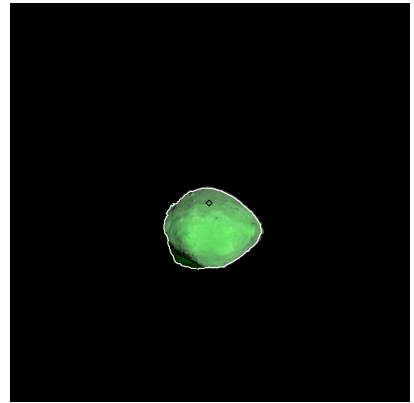


Figure 186:
ST_2413002859_v.fits

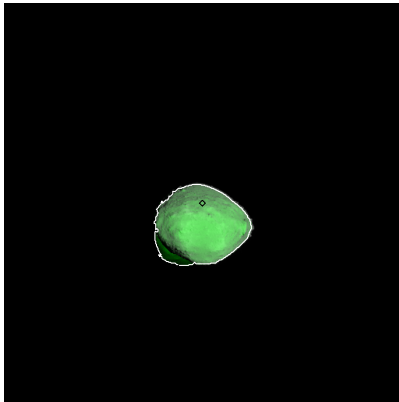


Figure 187:
ST_2413010544_v.fits

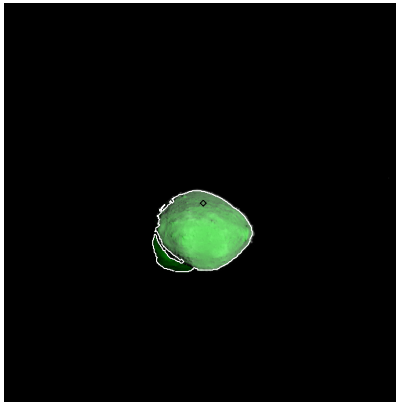


Figure 188:
ST_2413018229_v.fits

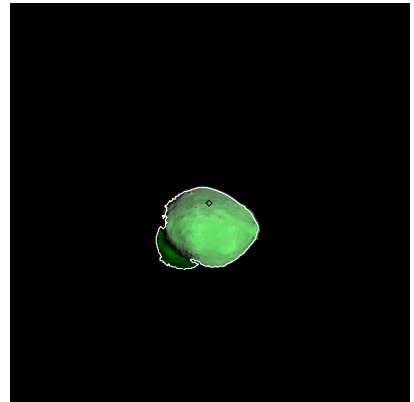


Figure 189:
ST_2413025897_v.fits

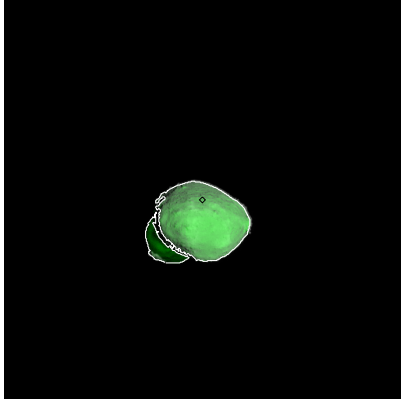


Figure 190:
ST_2413033582_v.fits

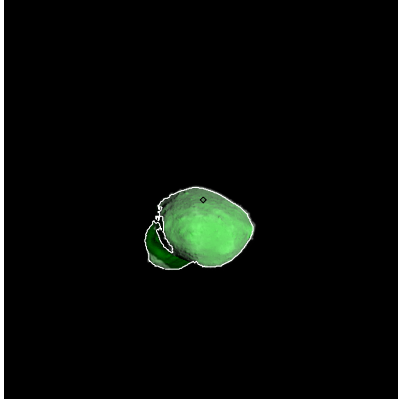


Figure 191:
ST_2413041267_v.fits

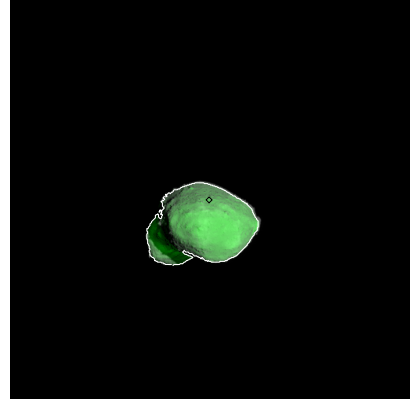


Figure 192:
ST_2413048952_v.fits

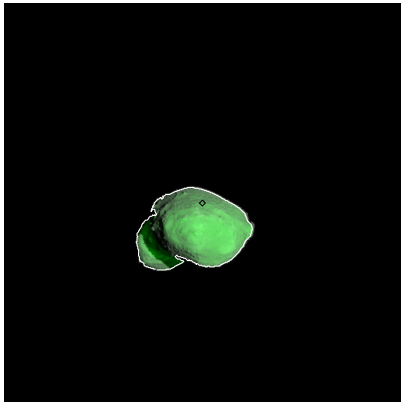


Figure 193:
ST_2413056637_v.fits

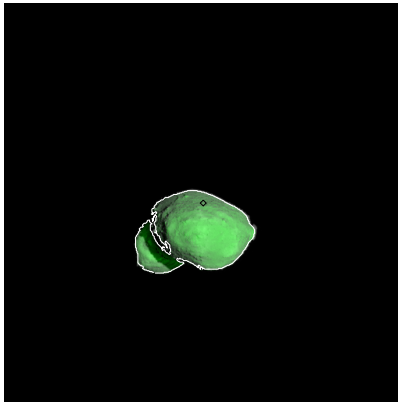


Figure 194:
ST_2413064306_v.fits

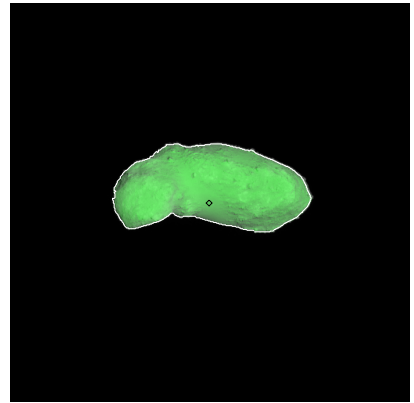


Figure 195:
ST_2414830788_v.fits

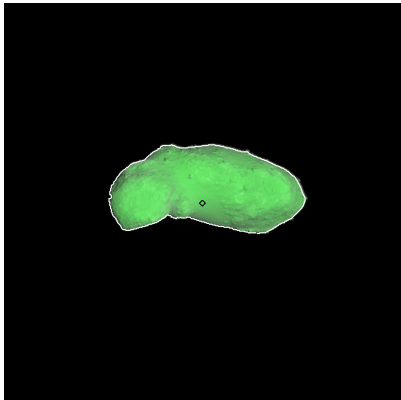


Figure 196:
ST_2414838473_v.fits

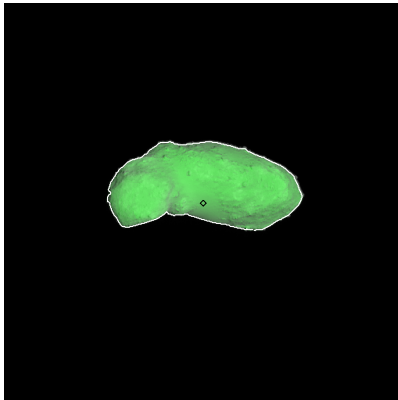


Figure 197:
ST_2414846142_v.fits

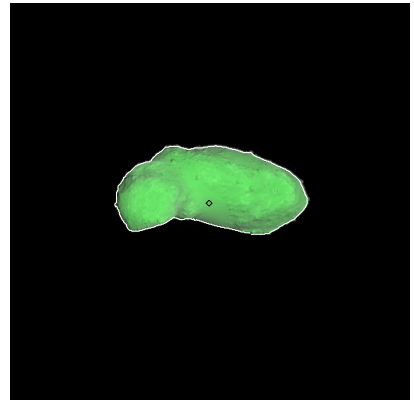


Figure 198:
ST_2414853859_v.fits

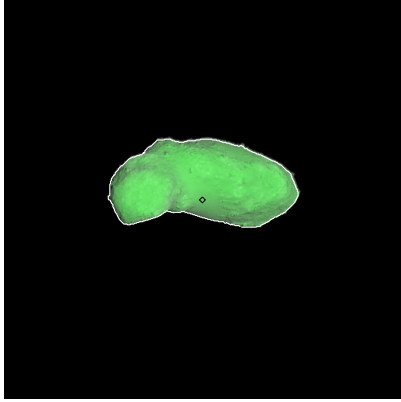


Figure 199:
ST_2414861544_v.fits

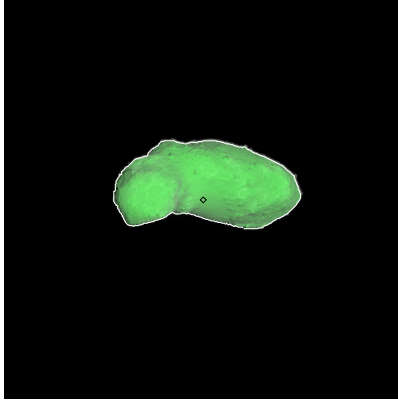


Figure 200:
ST_2414869213_v.fits

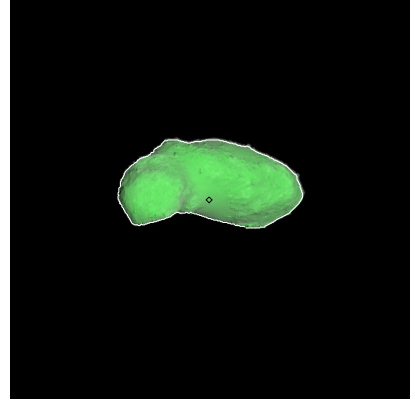


Figure 201:
ST_2414876898_v.fits

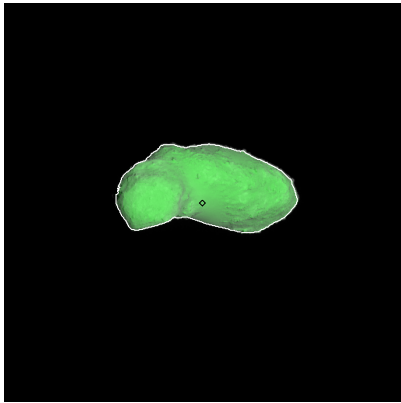


Figure 202:
ST_2414884583_v.fits

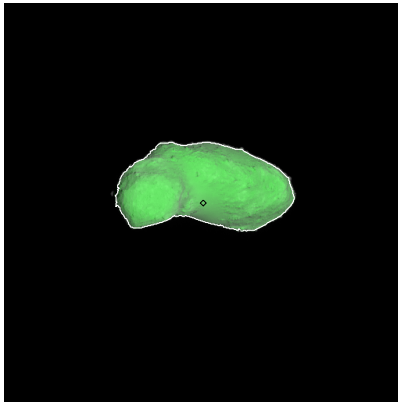


Figure 203:
ST_2414892251_v.fits

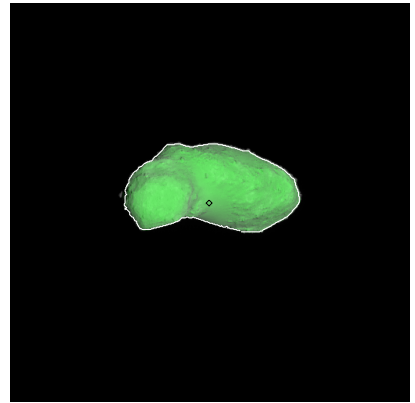


Figure 204:
ST_2414899936_v.fits

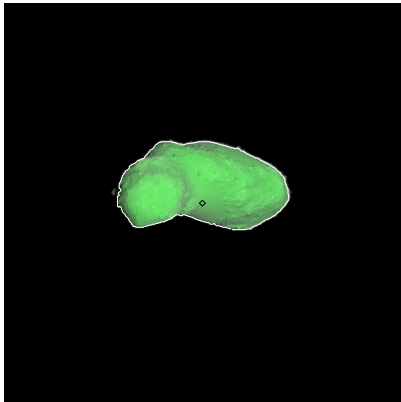


Figure 205:
ST_2414907605_v.fits

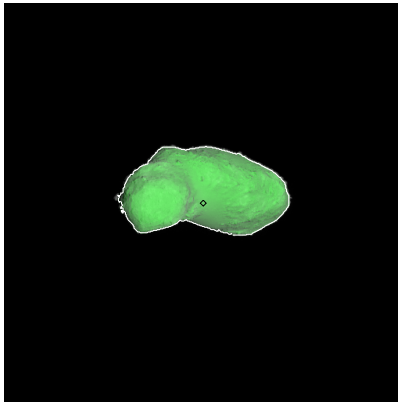


Figure 206:
ST_2414915290_v.fits

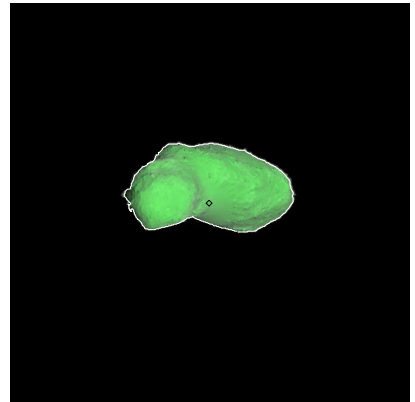


Figure 207:
ST_2414922975_v.fits

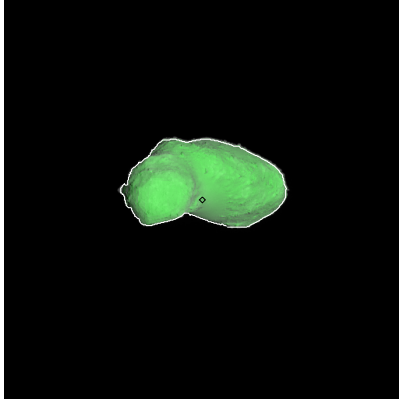


Figure 208:
ST_2414930643_v.fits

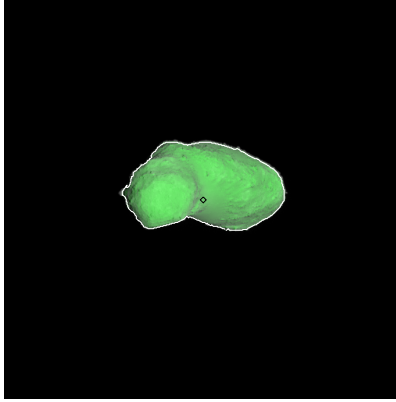


Figure 209:
ST_2414938329_v.fits

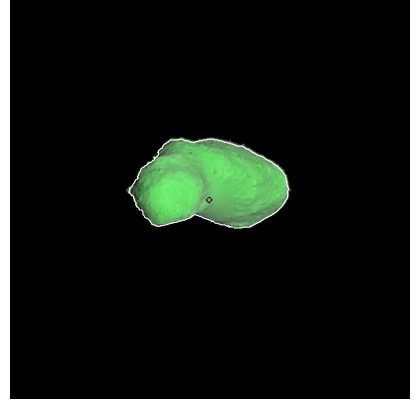


Figure 210:
ST_2414946014_v.fits

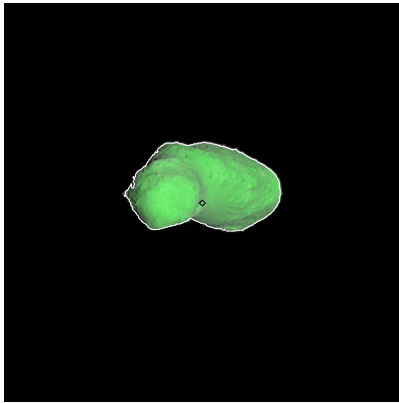


Figure 211:
ST_2414953699_v.fits

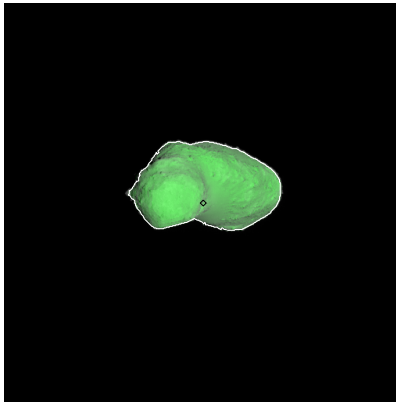


Figure 212:
ST_2414961367_v.fits

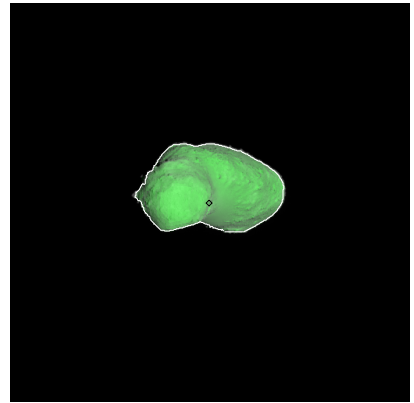


Figure 213:
ST_2414969052_v.fits

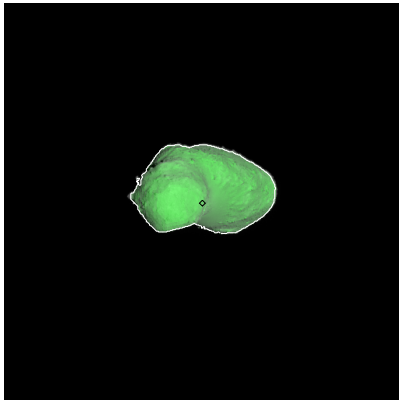


Figure 214:
ST_2414976721_v.fits

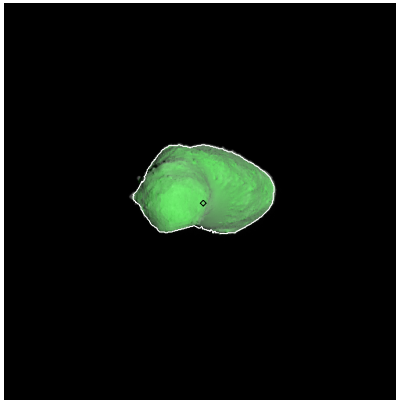


Figure 215:
ST_2414984406_v.fits

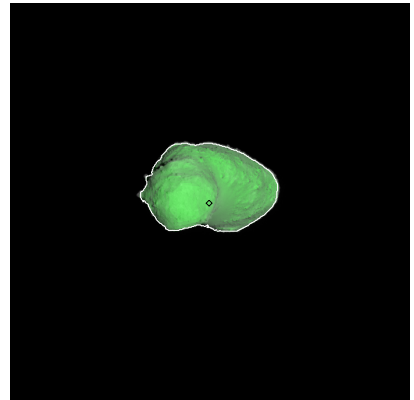


Figure 216:
ST_2414992074_v.fits

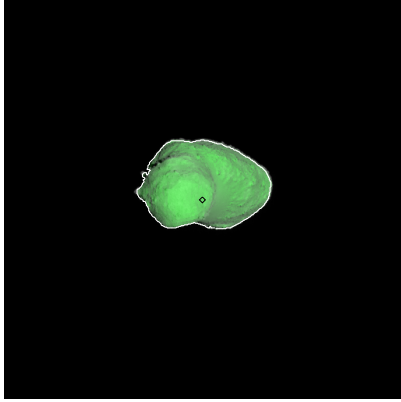


Figure 217:
ST_2414999759_v.fits

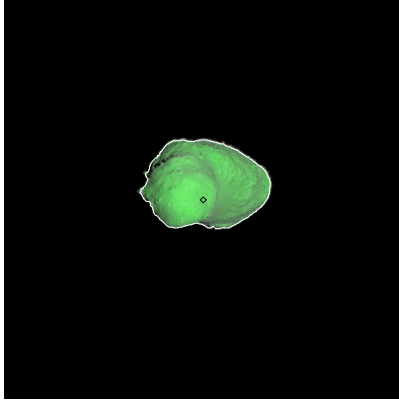


Figure 218:
ST_2415007444_v.fits

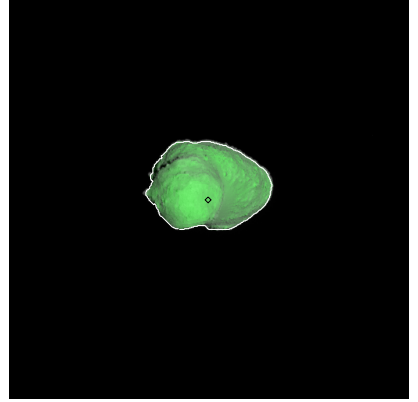


Figure 219:
ST_2415015129_v.fits

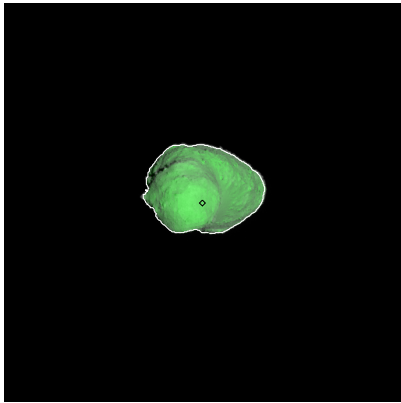


Figure 220:
ST_2415022798_v.fits

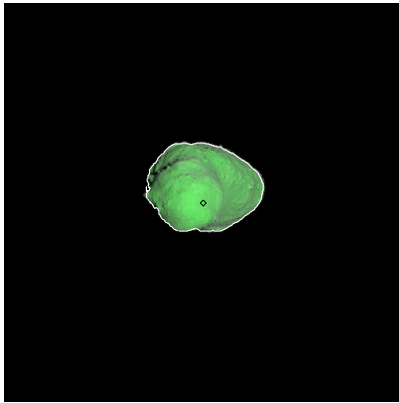


Figure 221:
ST_2415030483_v.fits

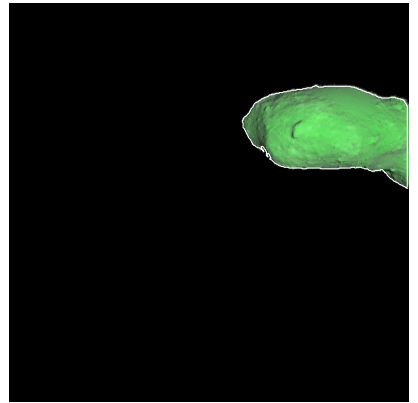


Figure 222:
ST_2415529685_v.fits

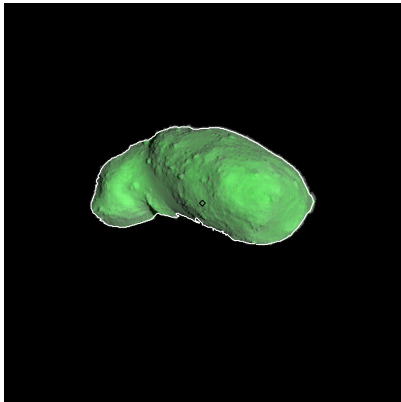


Figure 223:
ST_2417359514_v.fits

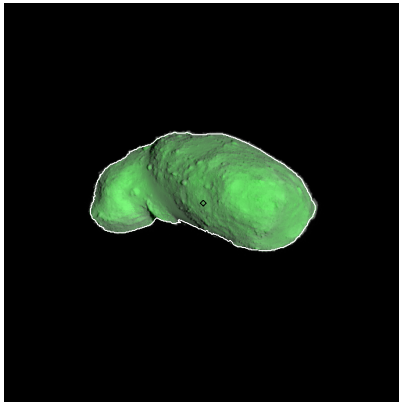


Figure 224:
ST_2417367215_v.fits

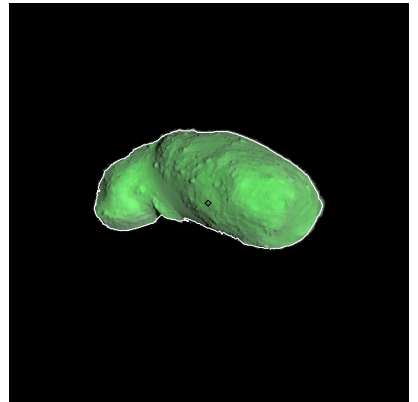


Figure 225:
ST_2417374900_v.fits



Figure 226:
ST_2417382552_v.fits

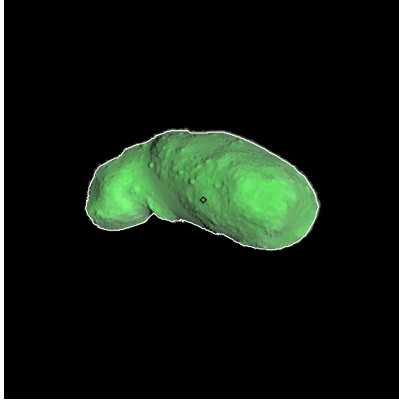


Figure 227:
ST_2417390237_v.fits



Figure 228:
ST_2417397906_v.fits



Figure 229:
ST_2417405591_v.fits



Figure 230:
ST_2417413276_v.fits



Figure 231:
ST_2417420977_v.fits



Figure 232:
ST_2417428662_v.fits



Figure 233:
ST_2417436347_v.fits



Figure 234:
ST_2417444032_v.fits



Figure 235:
ST_2417451717_v.fits



Figure 236:
ST_2417459402_v.fits



Figure 237:
ST_2417467070_v.fits



Figure 238:
ST_2417474756_v.fits



Figure 239:
ST_2417482440_v.fits



Figure 240:
ST_2417490109_v.fits



Figure 241:
ST_2417497794_v.fits



Figure 242:
ST_2417505479_v.fits



Figure 243:
ST_2417513164_v.fits



Figure 244:
ST_2417520833_v.fits



Figure 245:
ST_2417528518_v.fits



Figure 246:
ST_2417536203_v.fits



Figure 247:
ST_2417543888_v.fits



Figure 248:
ST_2417551556_v.fits

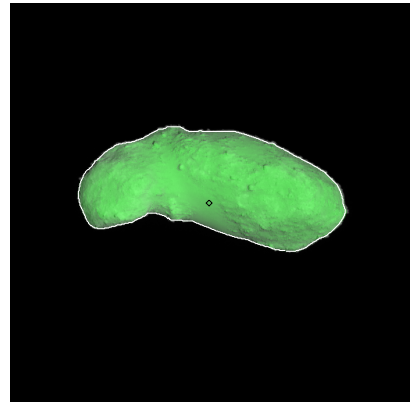


Figure 249:
ST_2417559241_v.fits

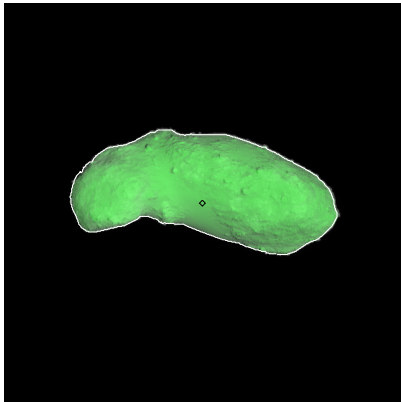


Figure 250:
ST_2417566910_v.fits

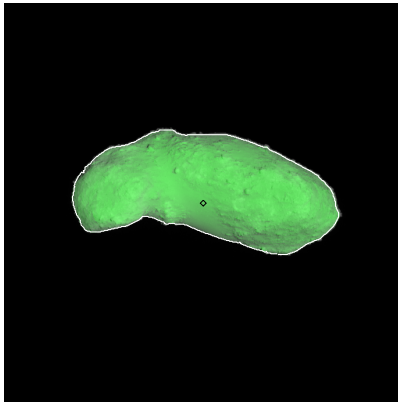


Figure 251:
ST_2417574594_v.fits



Figure 252:
ST_2417582279_v.fits



Figure 253:
ST_2417589964_v.fits

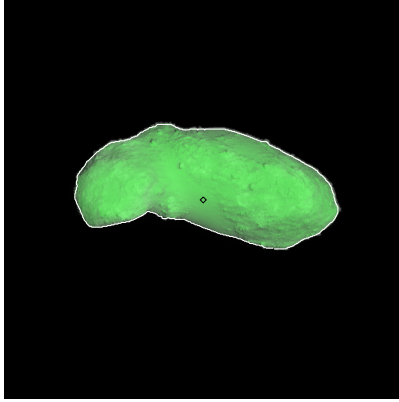


Figure 254:
ST_2417597632_v.fits



Figure 255:
ST_2417605317_v.fits

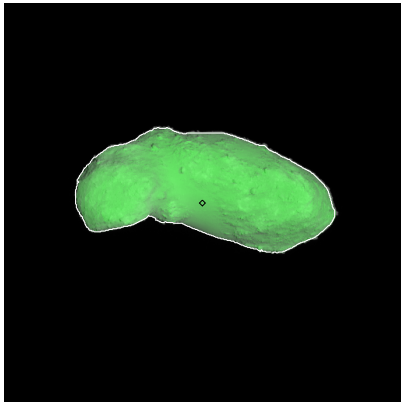


Figure 256:
ST_2417613002_v.fits

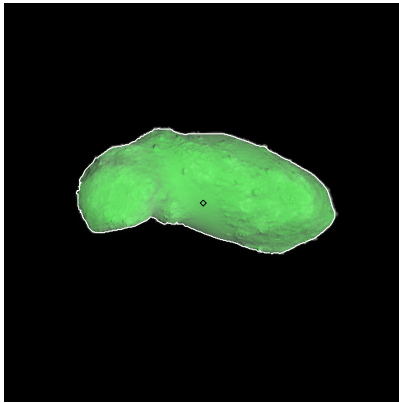


Figure 257:
ST_2417620671_v.fits

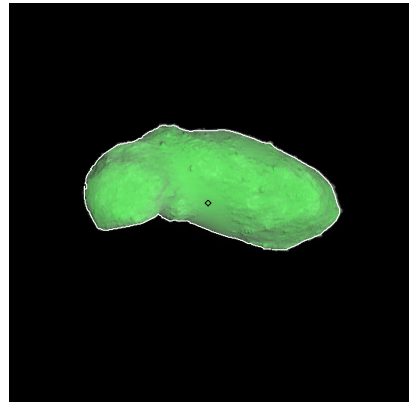


Figure 258:
ST_2417628356_v.fits

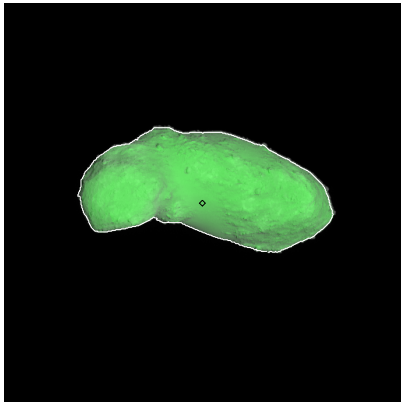


Figure 259:
ST_2417636041_v.fits

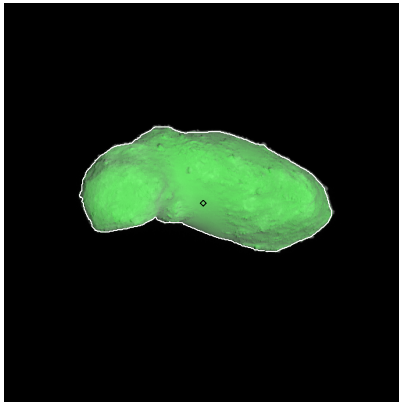


Figure 260:
ST_2417643709_v.fits

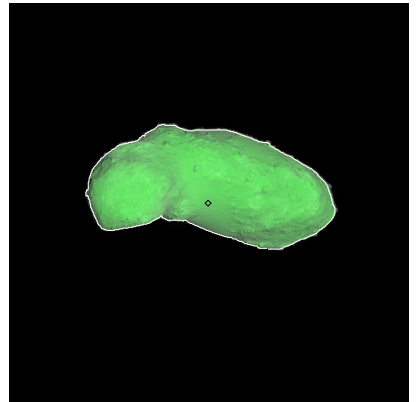


Figure 261:
ST_2417651394_v.fits

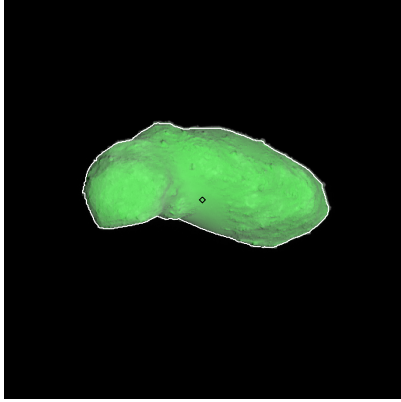


Figure 262:
ST_2417659079_v.fits

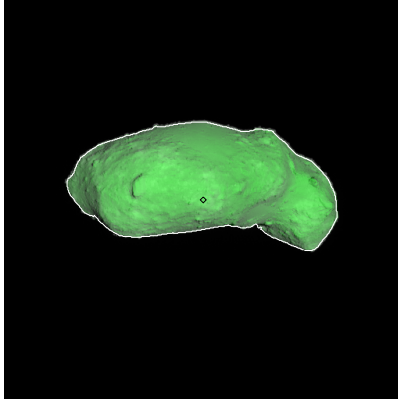


Figure 263:
ST_2418659460_b.fits

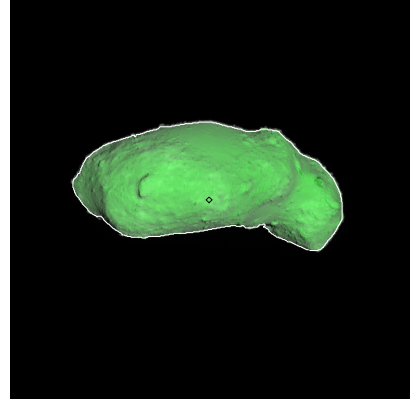


Figure 264:
ST_2418699769_v.fits

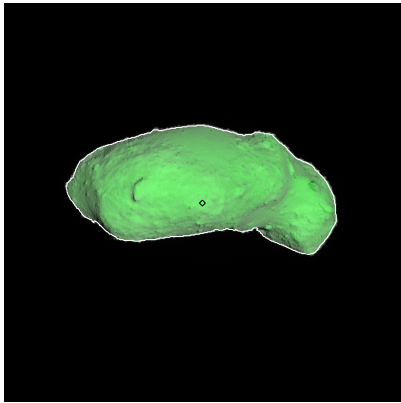


Figure 265:
ST_2418768895_w.fits

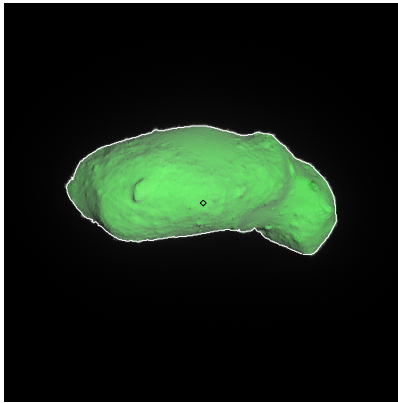


Figure 266:
ST_2418807291_p.fits

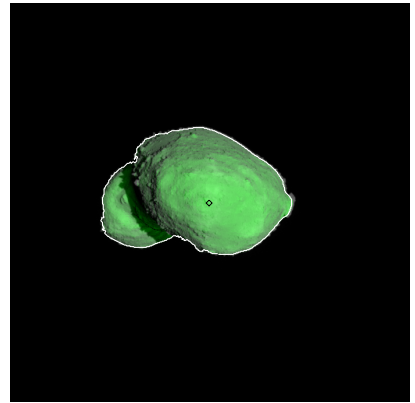


Figure 267:
ST_2418848189_v.fits

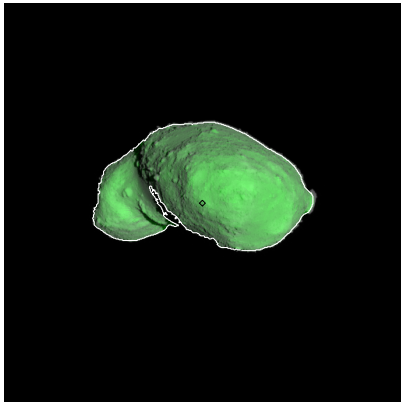


Figure 268:
ST_2418859748_v.fits

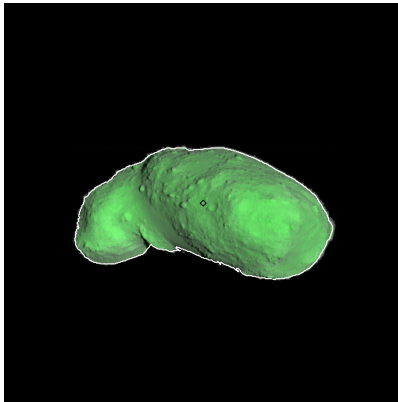


Figure 269:
ST_2418871275_v.fits

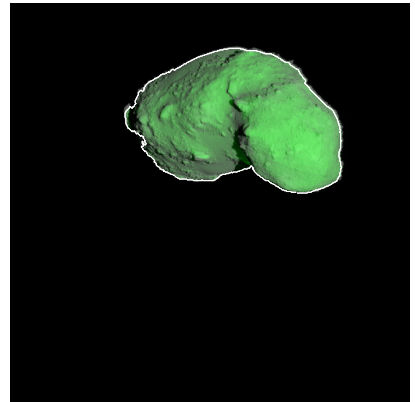


Figure 270:
ST_2419372913_v.fits

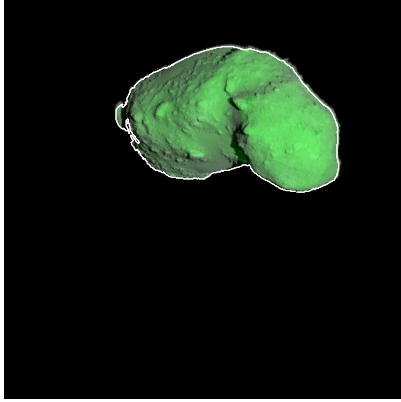


Figure 271:
ST_2419381121_v.fits

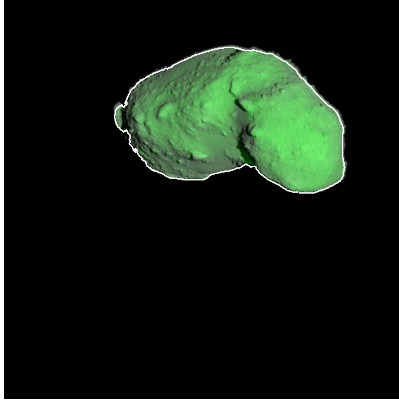


Figure 272:
ST_2419389297_v.fits

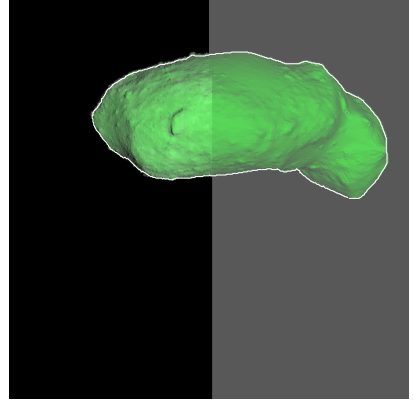


Figure 273:
ST_2419737518_v.fits

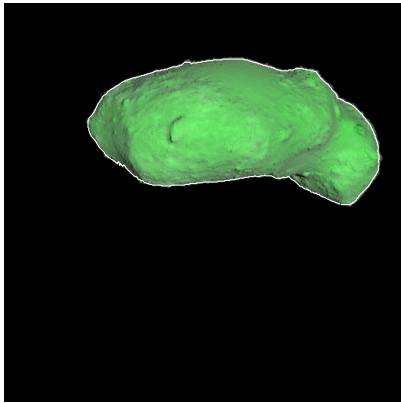


Figure 274:
ST_2419745677_v.fits

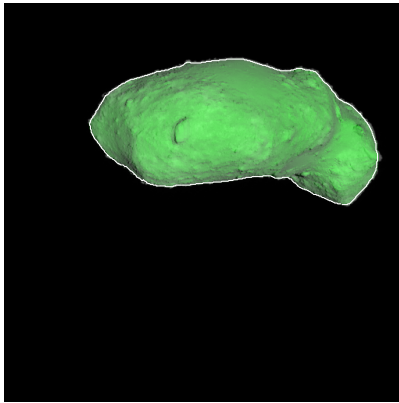


Figure 275:
ST_2419753902_v.fits

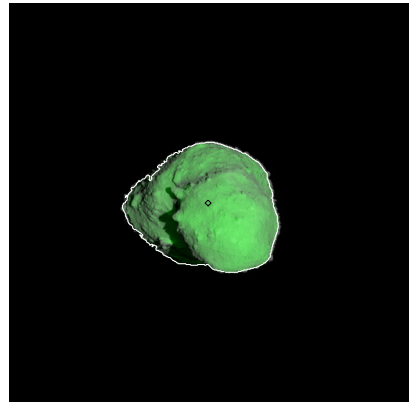


Figure 276:
ST_2420699983_v.fits

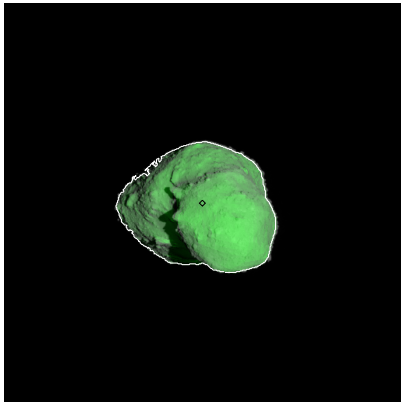


Figure 277:
ST_2420708174_v.fits

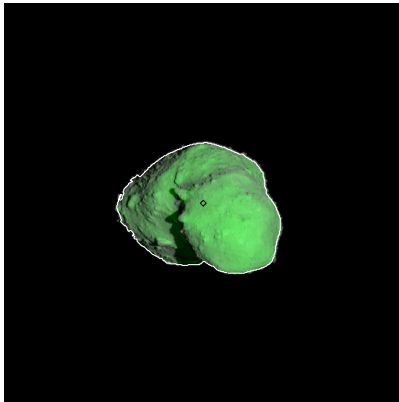


Figure 278:
ST_2420716366_v.fits

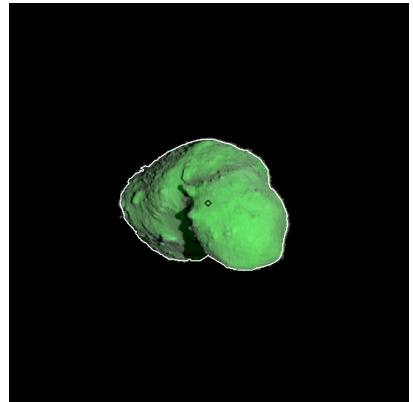


Figure 279:
ST_2420724574_v.fits

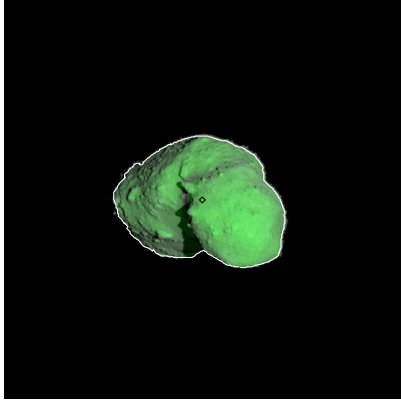


Figure 280:
ST_2420732749_v.fits

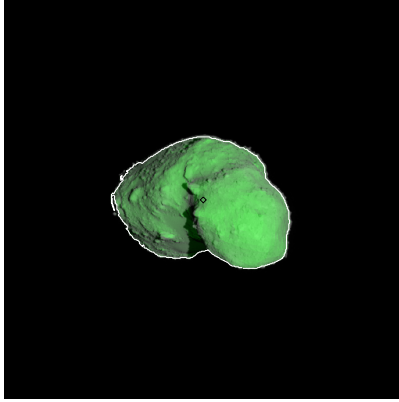


Figure 281:
ST_2420740941_v.fits

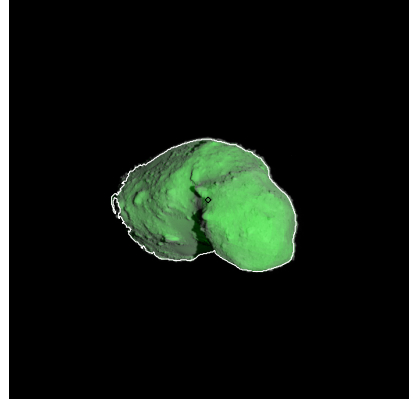


Figure 282:
ST_2420749149_v.fits

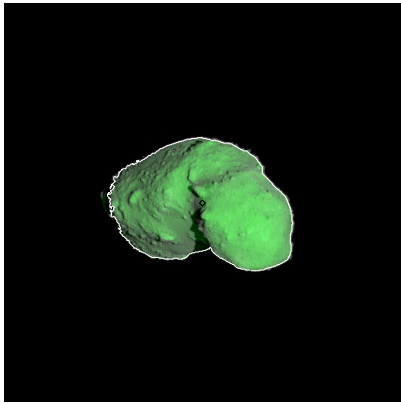


Figure 283:
ST_2420757341_v.fits

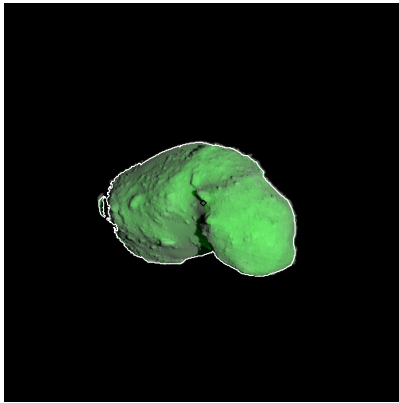


Figure 284:
ST_2420765516_v.fits

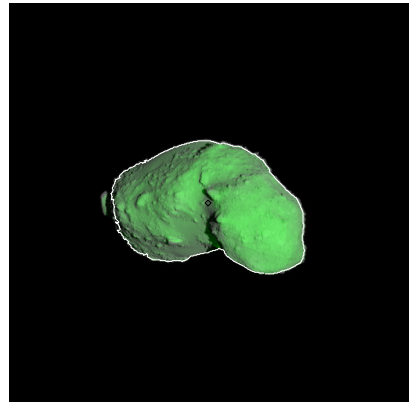


Figure 285:
ST_2420773724_v.fits

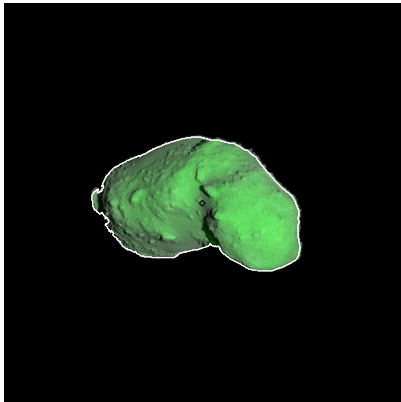


Figure 286:
ST_2420781916_v.fits

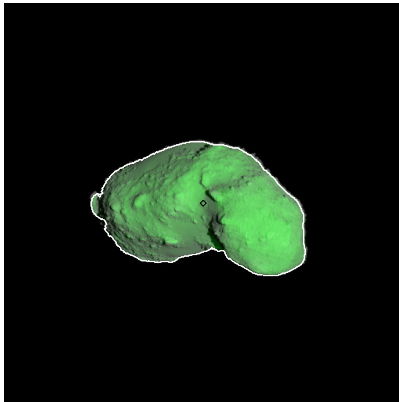


Figure 287:
ST_2420790124_v.fits

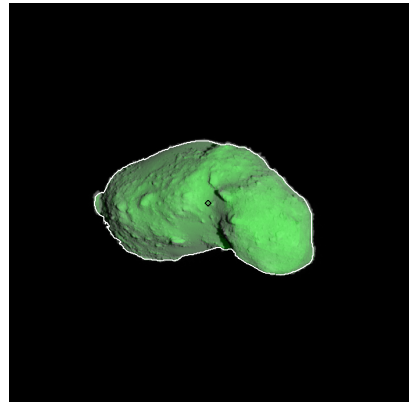


Figure 288:
ST_2420798316_v.fits

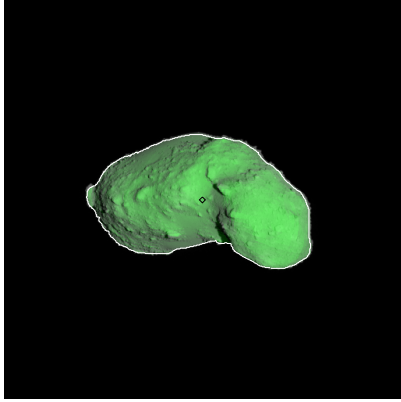


Figure 289:
ST_2420806508_v.fits

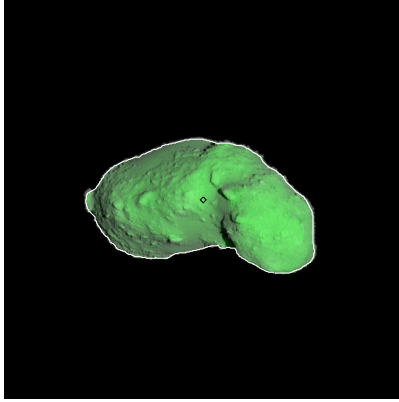


Figure 290:
ST_2420814700_v.fits

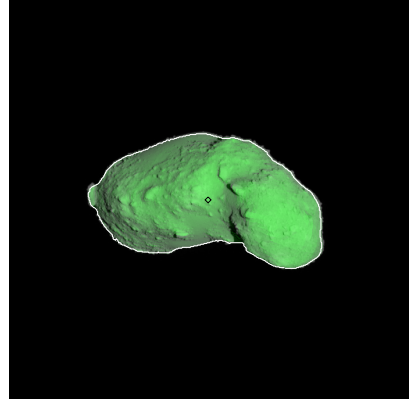


Figure 291:
ST_2420822891_v.fits

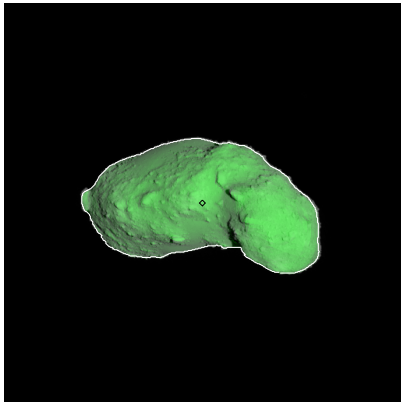


Figure 292:
ST_2420831083_v.fits

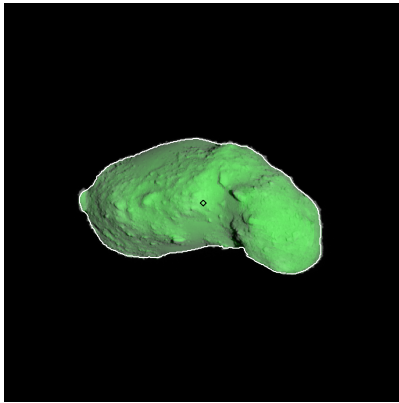


Figure 293:
ST_2420839291_v.fits

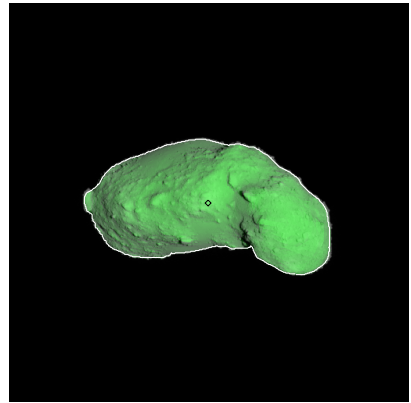


Figure 294:
ST_2420847483_v.fits

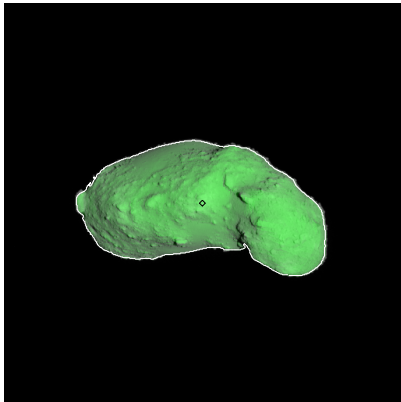


Figure 295:
ST_2420855658_v.fits

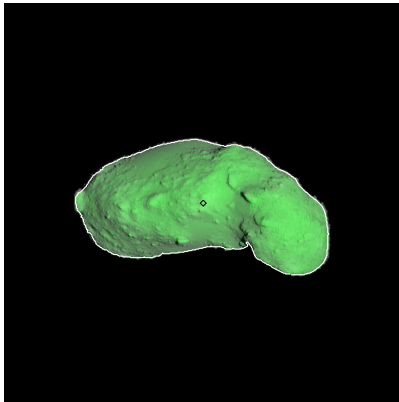


Figure 296:
ST_2420863866_v.fits

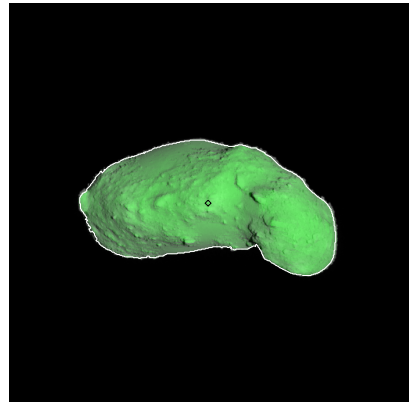


Figure 297:
ST_2420872042_v.fits

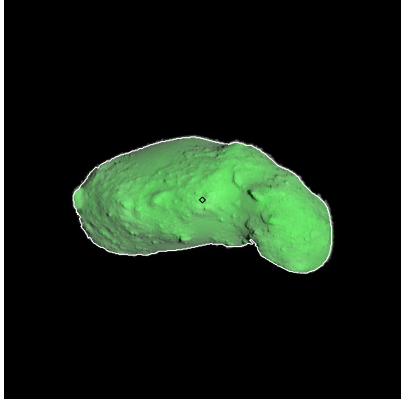


Figure 298:
ST_2420880266_v.fits

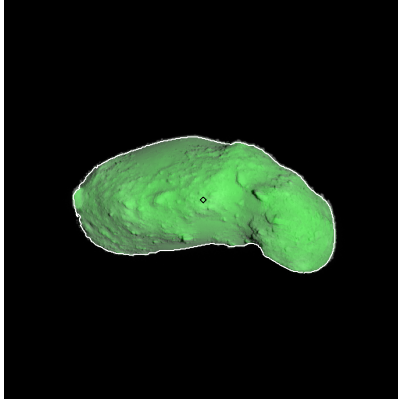


Figure 299:
ST_2420888441_v.fits

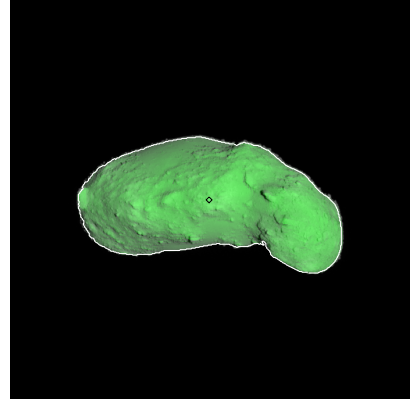


Figure 300:
ST_2420896633_v.fits

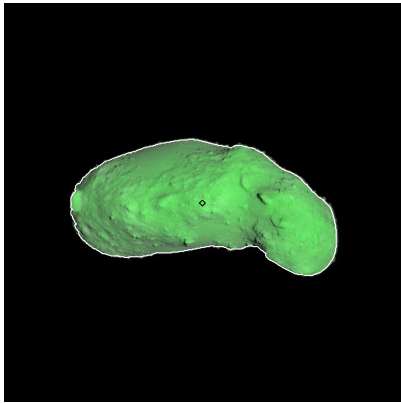


Figure 301:
ST_2420904858_v.fits

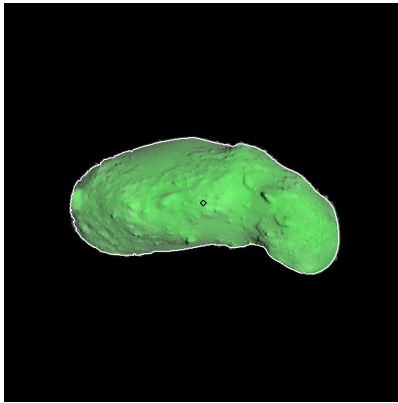


Figure 302:
ST_2420913017_v.fits

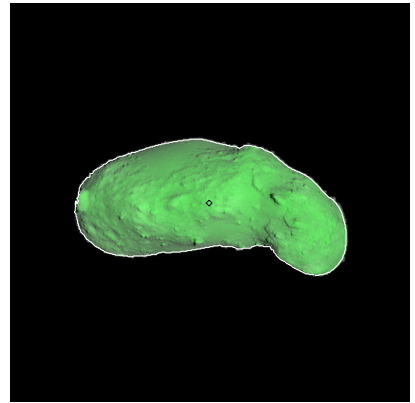


Figure 303:
ST_2420921208_v.fits



Figure 304:
ST_2420929416_v.fits



Figure 305:
ST_2420937608_v.fits



Figure 306:
ST_2420945783_v.fits



Figure 307:
ST_2420954008_v.fits

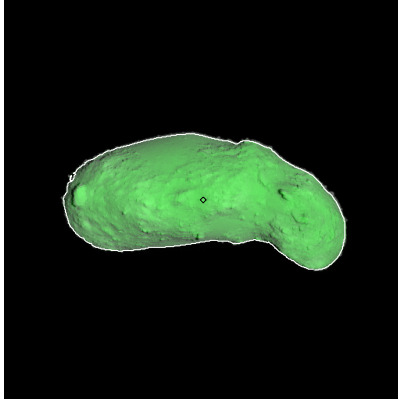


Figure 308:
ST_2420962183_v.fits



Figure 309:
ST_2420970358_v.fits



Figure 310:
ST_2420978583_v.fits



Figure 311:
ST_2420986758_v.fits



Figure 312:
ST_2420994934_v.fits



Figure 313:
ST_2421003158_v.fits

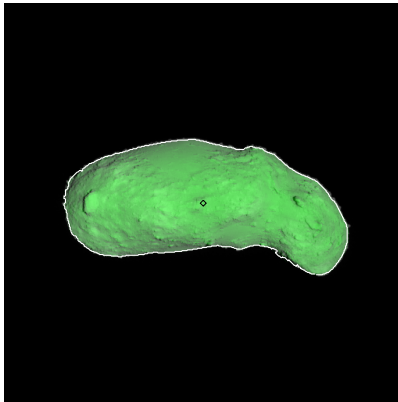


Figure 314:
ST_2421011334_v.fits



Figure 315:
ST_2421019509_v.fits



Figure 316:
ST_2421027733_v.fits

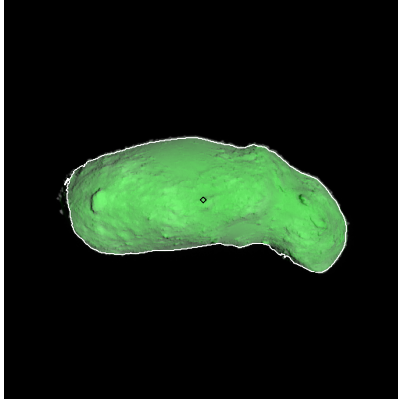


Figure 317:
ST_2421035909_v.fits

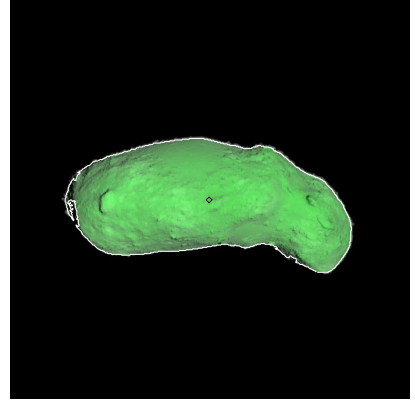


Figure 318:
ST_2421044100_v.fits

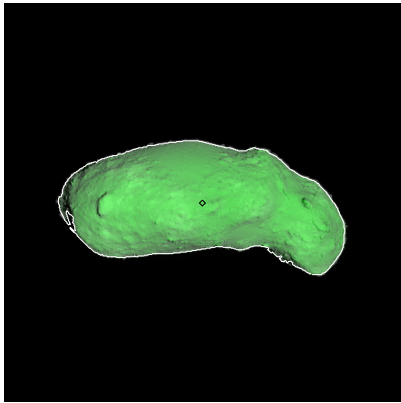


Figure 319:
ST_2421052308_v.fits

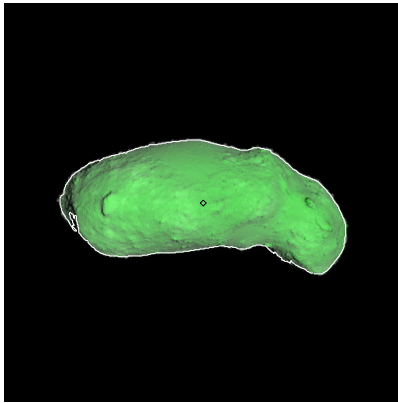


Figure 320:
ST_2421060484_v.fits

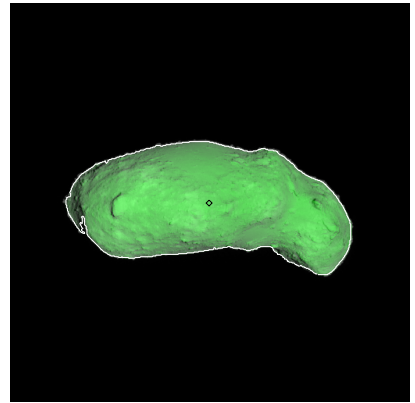


Figure 321:
ST_2421068659_v.fits

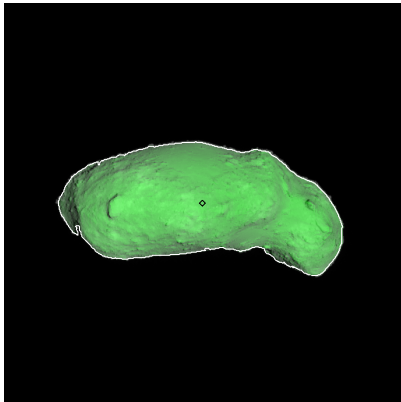


Figure 322:
ST_2421076883_v.fits

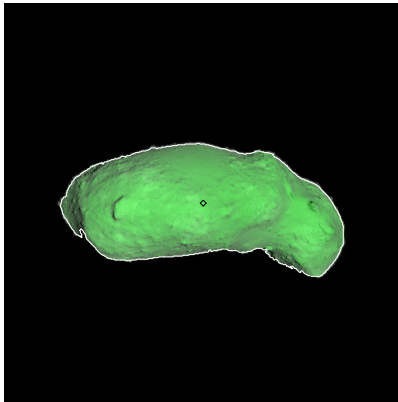


Figure 323:
ST_2421085059_v.fits

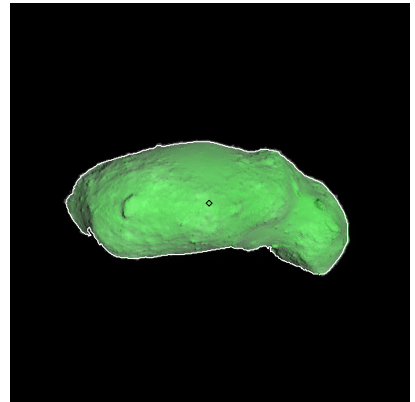


Figure 324:
ST_2421093234_v.fits

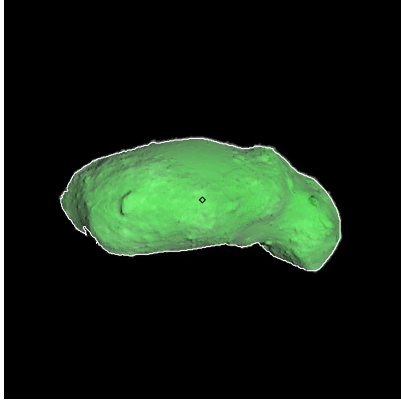


Figure 325:
ST_2421101459_v.fits

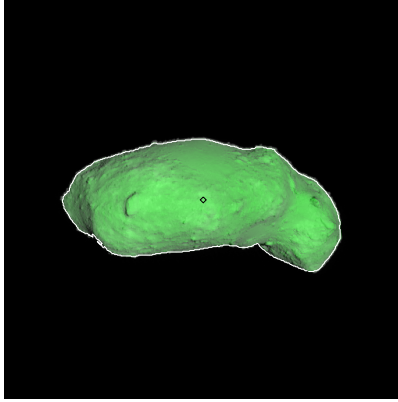


Figure 326:
ST_2421109634_v.fits

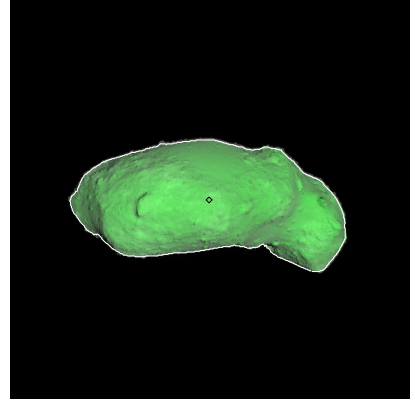


Figure 327:
ST_2421117826_v.fits

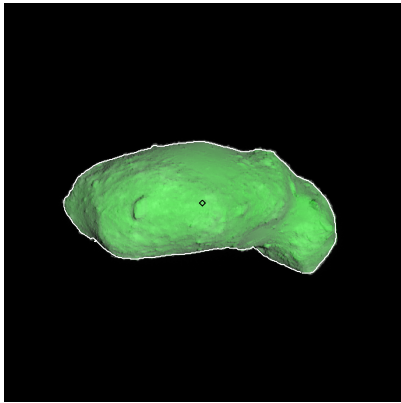


Figure 328:
ST_2421126034_v.fits

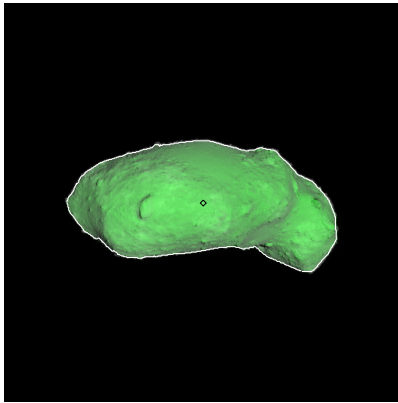


Figure 329:
ST_2421134209_v.fits

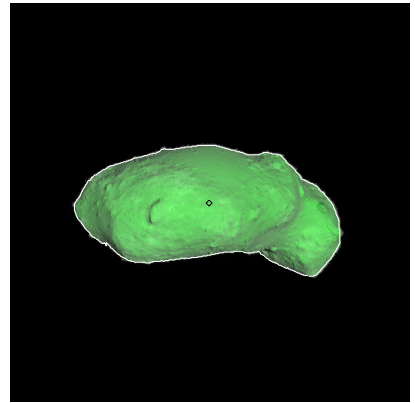


Figure 330:
ST_2421142401_v.fits

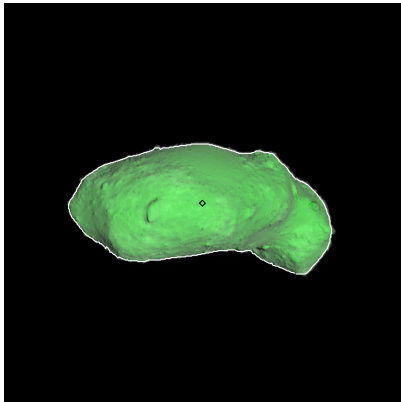


Figure 331:
ST_2421150608_v.fits

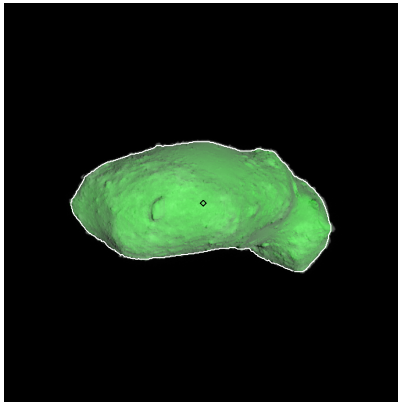


Figure 332:
ST_2421158784_v.fits

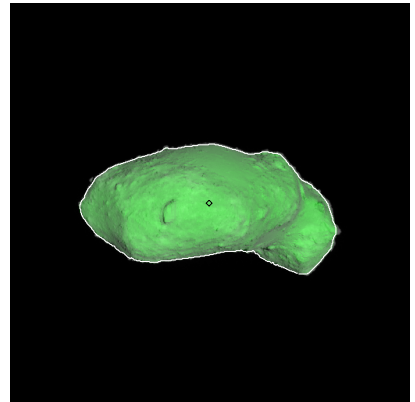


Figure 333:
ST_2421166959_v.fits

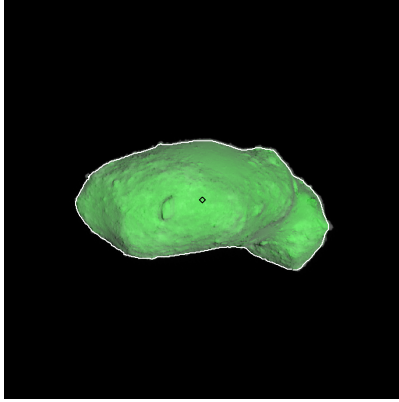


Figure 334:
ST_2421175183_v.fits

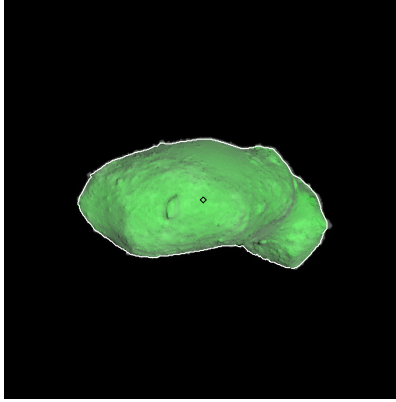


Figure 335:
ST_2421183359_v.fits

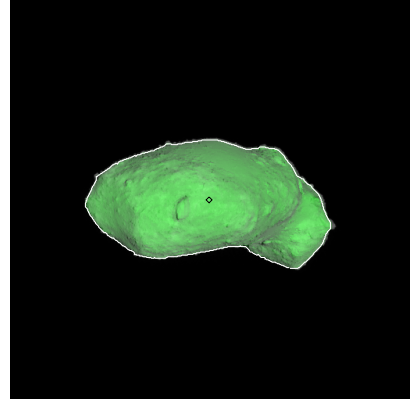


Figure 336:
ST_2421191534_v.fits

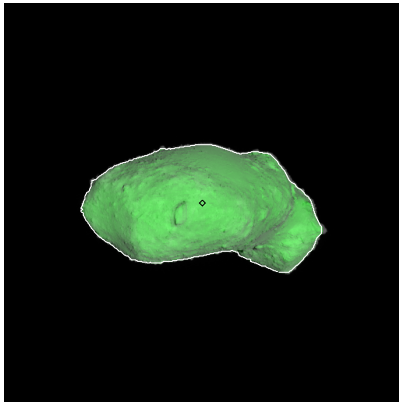


Figure 337:
ST_2421199726_v.fits

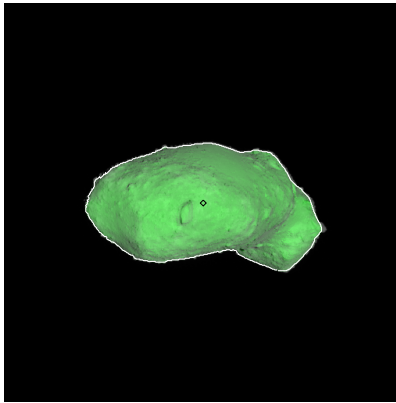


Figure 338:
ST_2421207934_v.fits

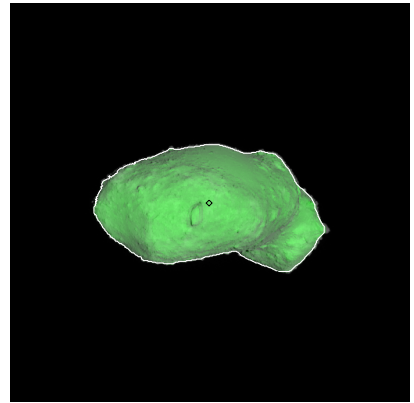


Figure 339:
ST_2421216109_v.fits

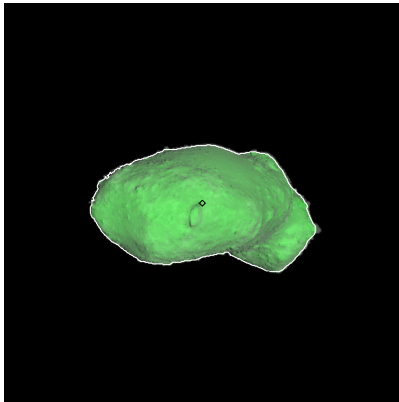


Figure 340:
ST_2421224301_v.fits

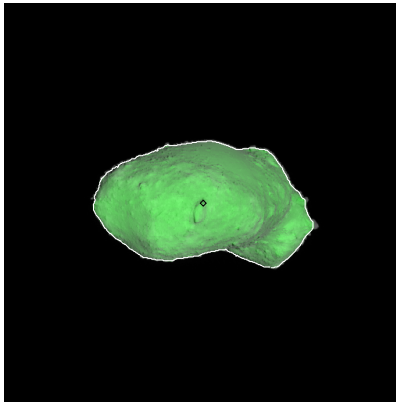


Figure 341:
ST_2421232492_v.fits

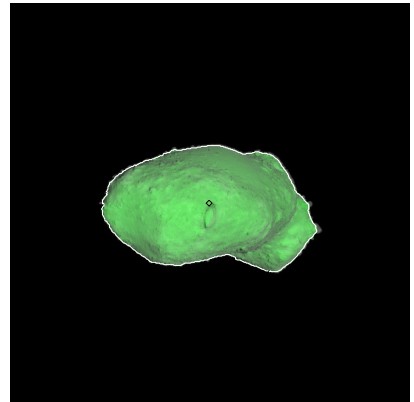


Figure 342:
ST_2421240684_v.fits

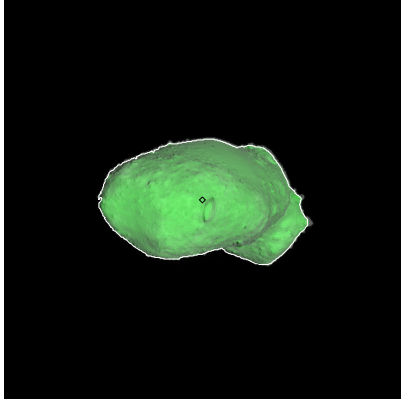


Figure 343:
ST_2421248876_v.fits

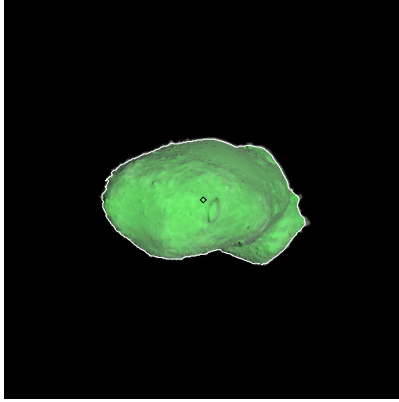


Figure 344:
ST_2421257067_v.fits

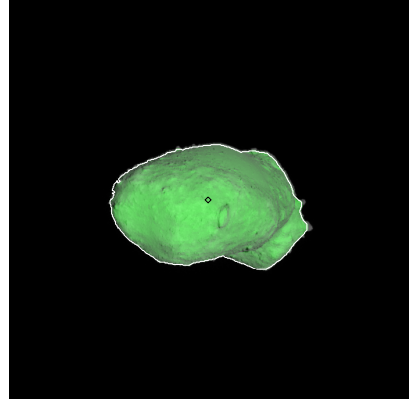


Figure 345:
ST_2421265243_v.fits

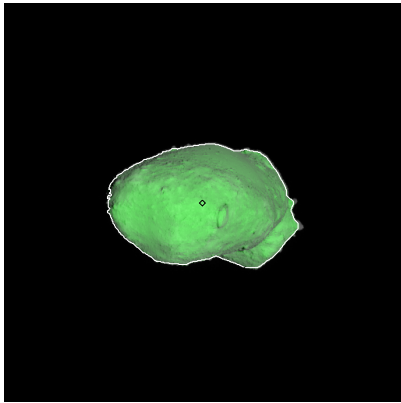


Figure 346:
ST_2421273451_v.fits

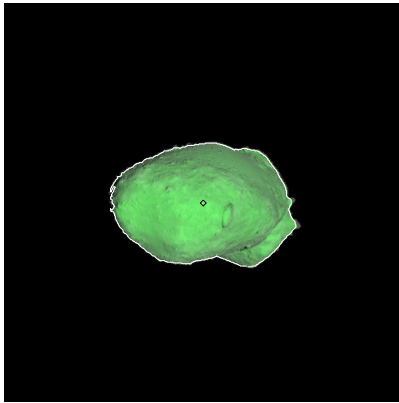


Figure 347:
ST_2421281610_v.fits

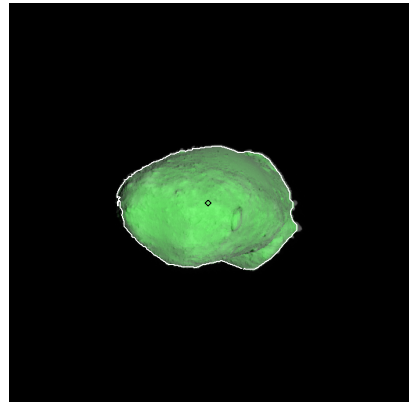


Figure 348:
ST_2421289818_v.fits

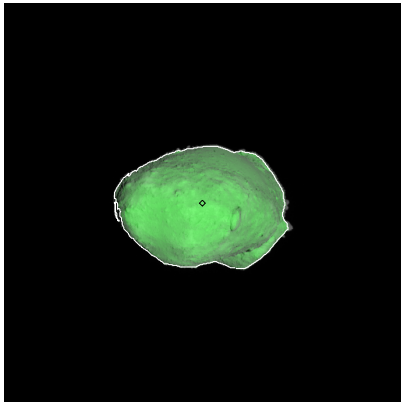


Figure 349:
ST_2421298010_v.fits

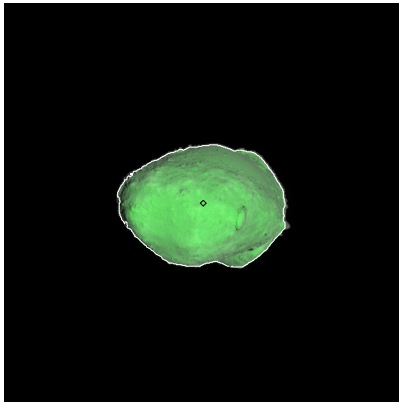


Figure 350:
ST_2421306185_v.fits

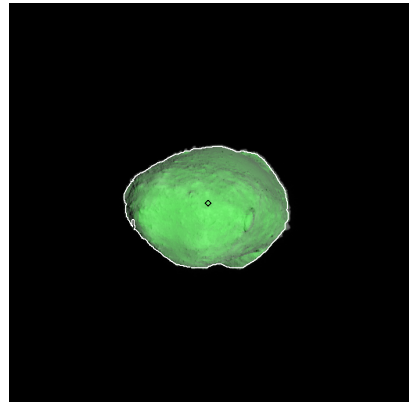


Figure 351:
ST_2421314393_v.fits

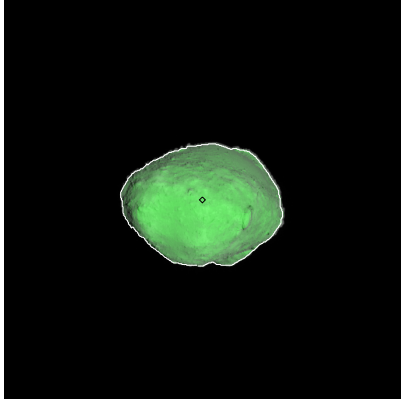


Figure 352:
ST_2421322585_v.fits

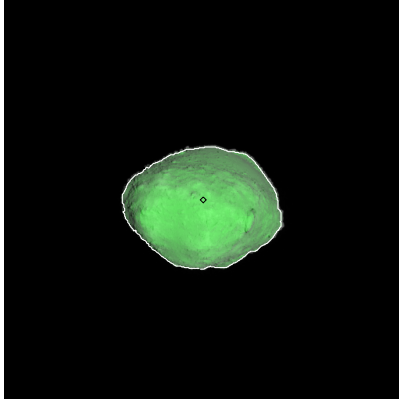


Figure 353:
ST_2421330744_v.fits

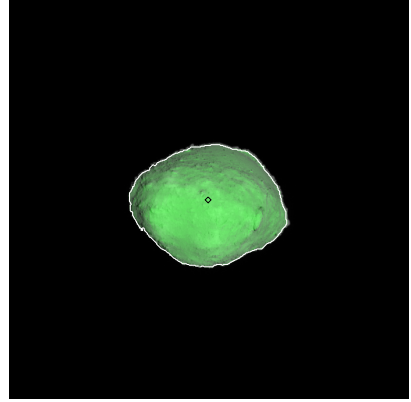


Figure 354:
ST_2421338968_v.fits

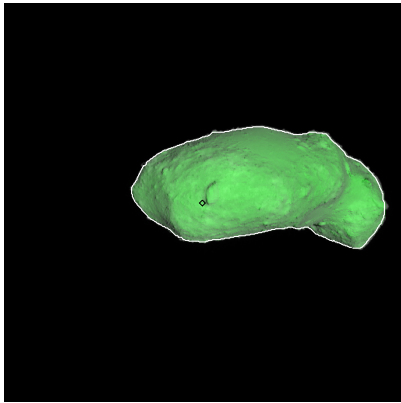


Figure 355:
ST_2422543206_v.fits

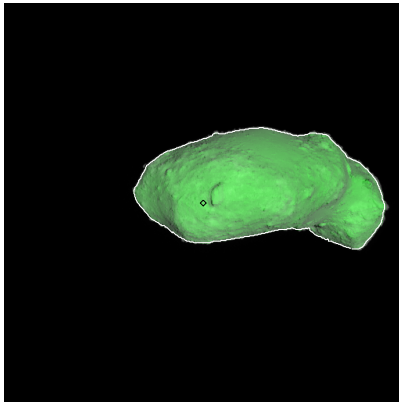


Figure 356:
ST_2422551414_v.fits

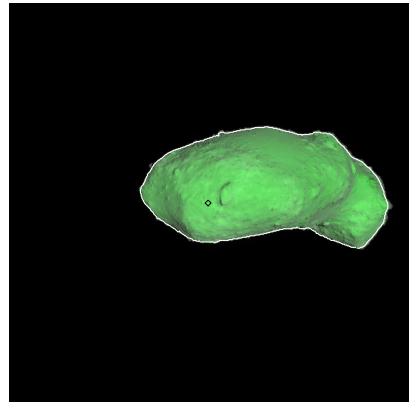


Figure 357:
ST_2422559606_v.fits

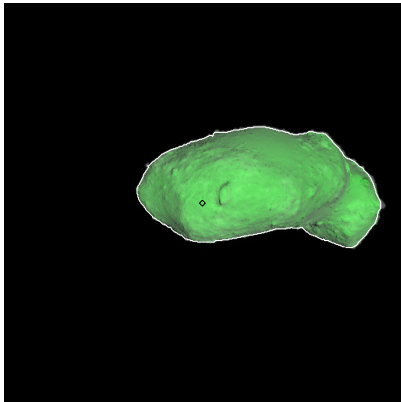


Figure 358:
ST_2422567781_v.fits

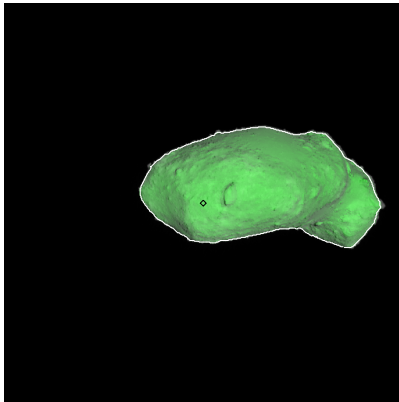


Figure 359:
ST_2422575989_v.fits

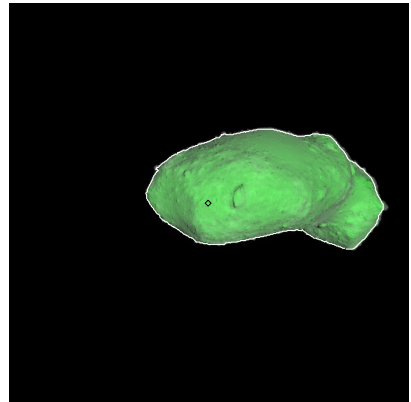


Figure 360:
ST_2422584197_v.fits

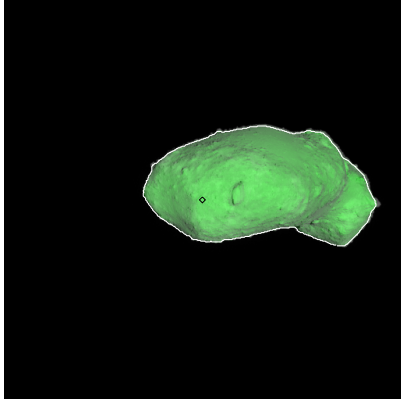


Figure 361:
ST_2422592356_v.fits

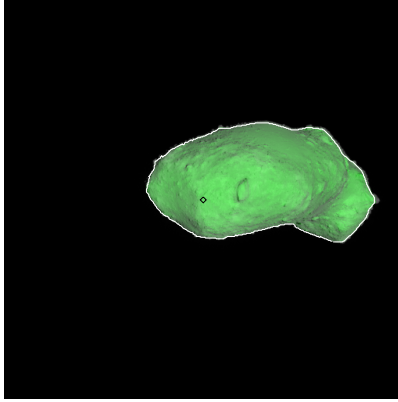


Figure 362:
ST_2422600548_v.fits

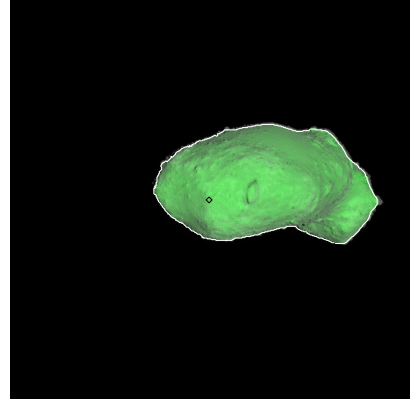


Figure 363:
ST_2422608772_v.fits

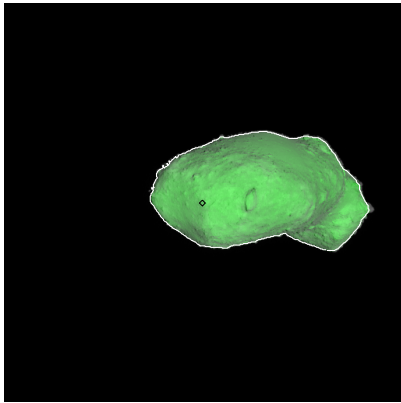


Figure 364:
ST_2422616931_v.fits

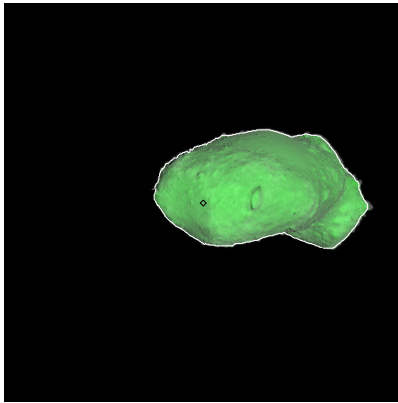


Figure 365:
ST_2422625123_v.fits

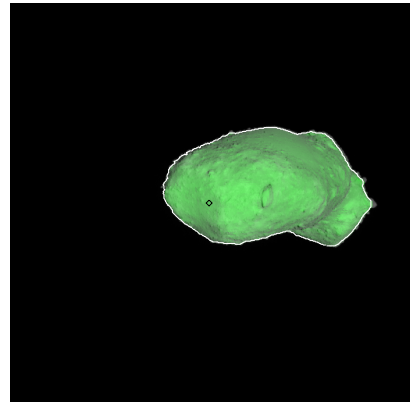


Figure 366:
ST_2422633331_v.fits

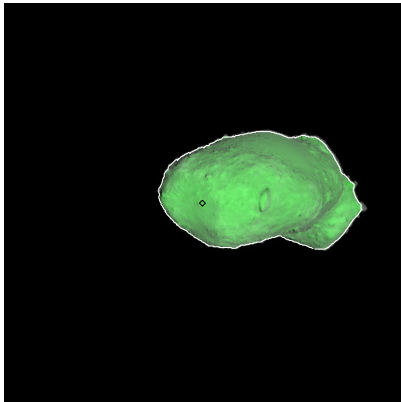


Figure 367:
ST_2422641506_v.fits

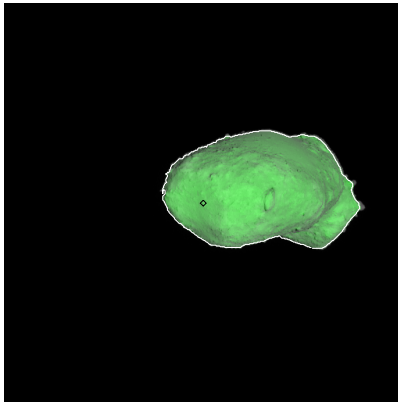


Figure 368:
ST_2422649698_v.fits

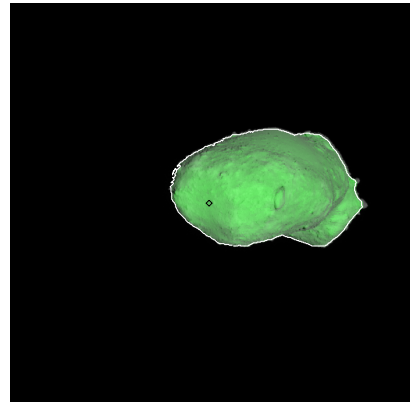


Figure 369:
ST_2422657889_v.fits

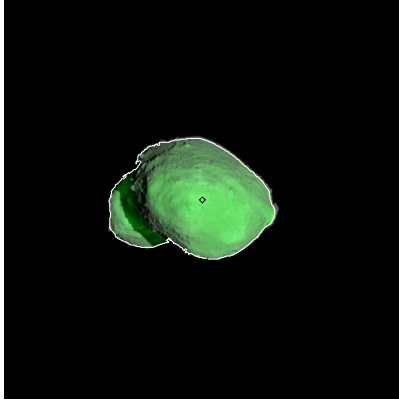


Figure 370:
ST_2422829908_v.fits

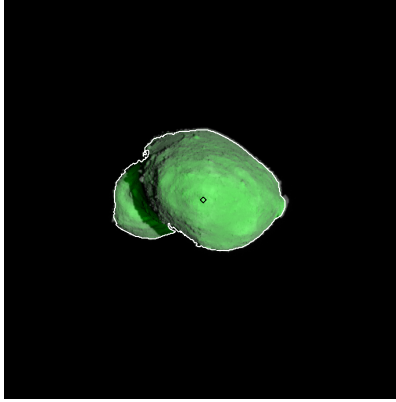


Figure 371:
ST_2422838068_v.fits

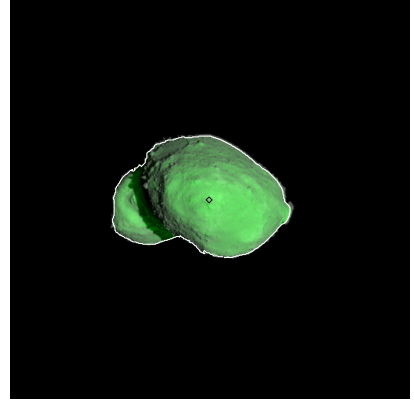


Figure 372:
ST_2422846292_v.fits

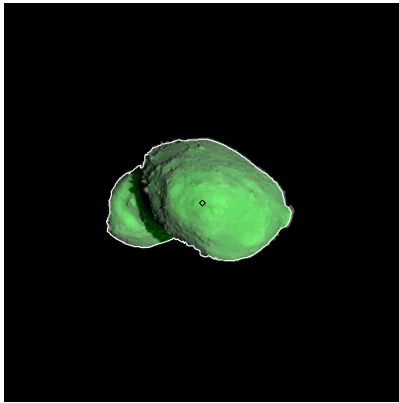


Figure 373:
ST_2422854484_v.fits

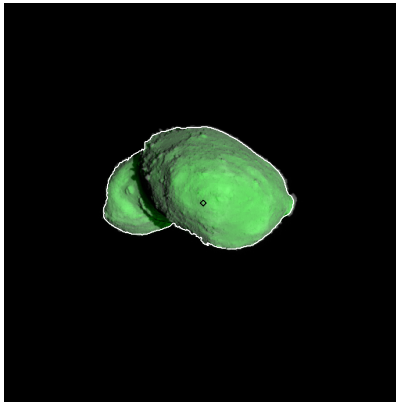


Figure 374:
ST_2422862675_v.fits

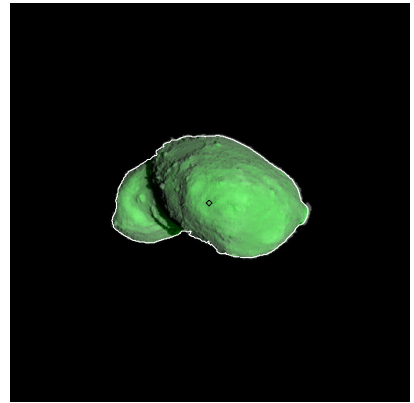


Figure 375:
ST_2422870867_v.fits

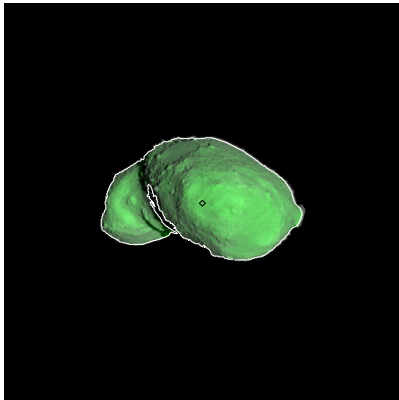


Figure 376:
ST_2422879059_v.fits

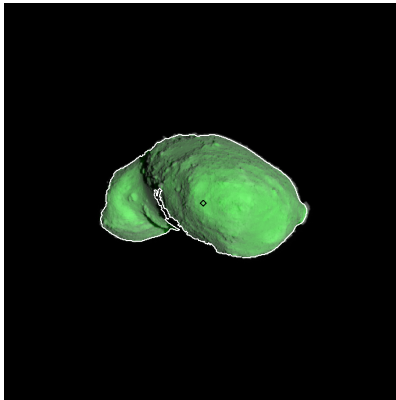


Figure 377:
ST_2422887250_v.fits

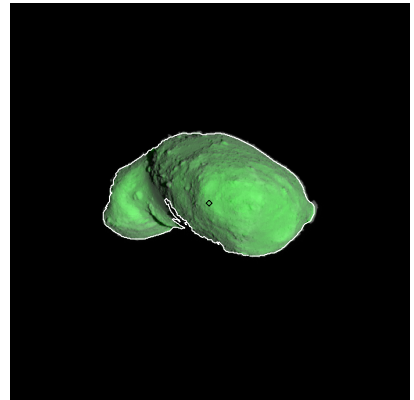


Figure 378:
ST_2422895458_v.fits

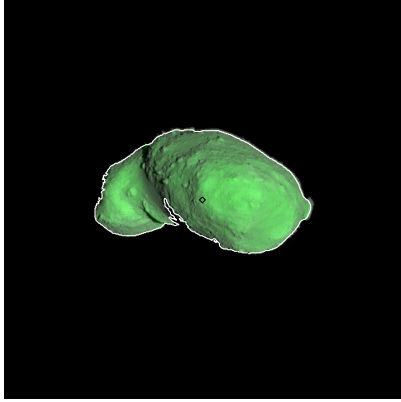


Figure 379:
ST_2422903667_v.fits

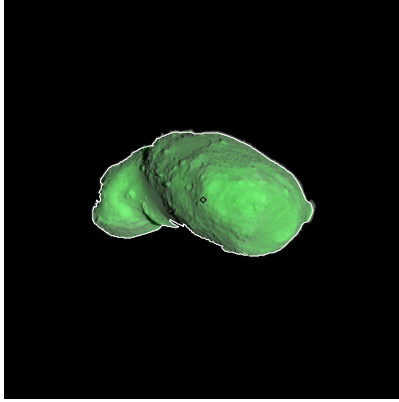


Figure 380:
ST_2422911842_v.fits

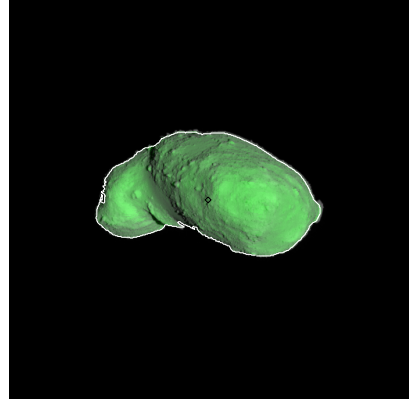


Figure 381:
ST_2422920034_v.fits

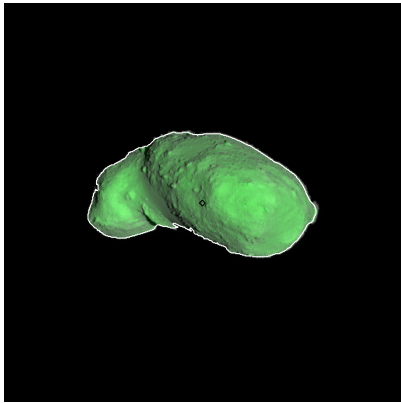


Figure 382:
ST_2422928258_v.fits

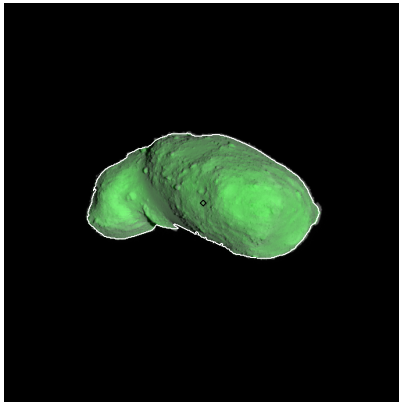


Figure 383:
ST_2422936417_v.fits

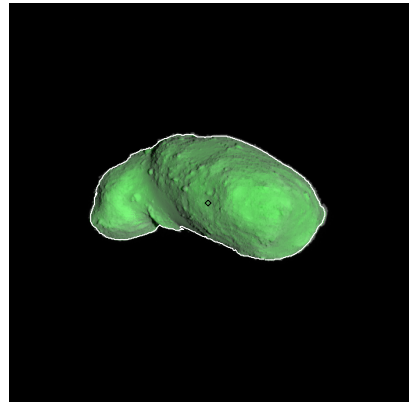


Figure 384:
ST_2422944609_v.fits

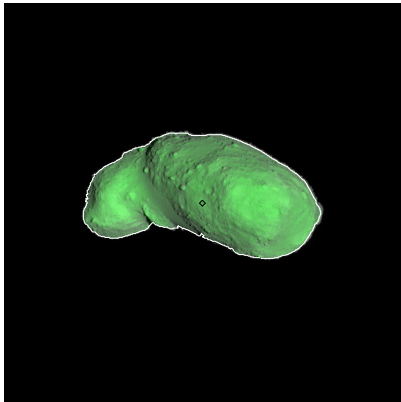


Figure 385:
ST_2422952833_v.fits

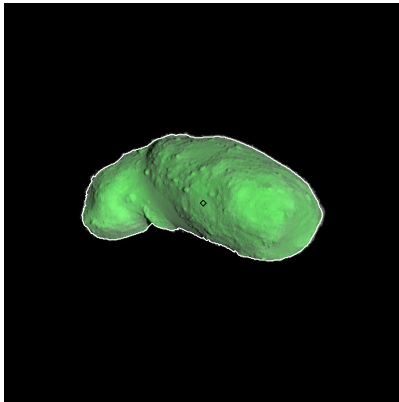


Figure 386:
ST_2422961009_v.fits



Figure 387:
ST_2422969200_v.fits



Figure 388:
ST_2422977408_v.fits



Figure 389:
ST_2422985584_v.fits



Figure 390:
ST_2422993775_v.fits



Figure 391:
ST_2423001983_v.fits



Figure 392:
ST_2423010158_v.fits



Figure 393:
ST_2423018350_v.fits



Figure 394:
ST_2423026558_v.fits



Figure 395:
ST_2423034734_v.fits



Figure 396:
ST_2423042925_v.fits



Figure 397:
ST_2423051150_v.fits



Figure 398:
ST_2423059309_v.fits



Figure 399:
ST_2423067517_v.fits



Figure 400:
ST_2423075725_v.fits

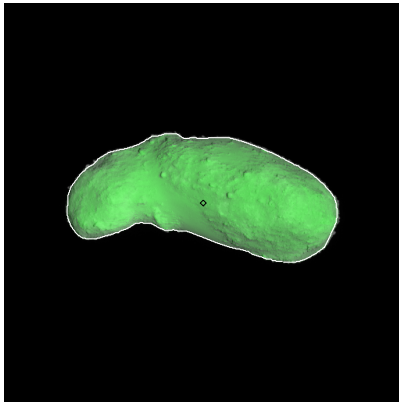


Figure 401:
ST_2423083900_v.fits

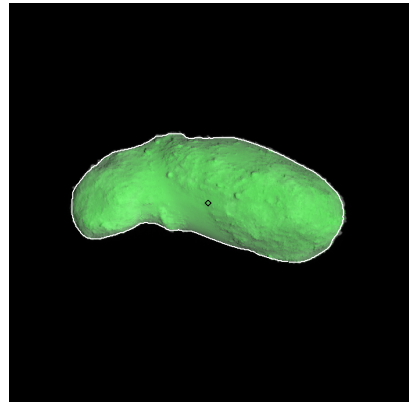


Figure 402:
ST_2423092092_v.fits



Figure 403:
ST_2423100300_v.fits

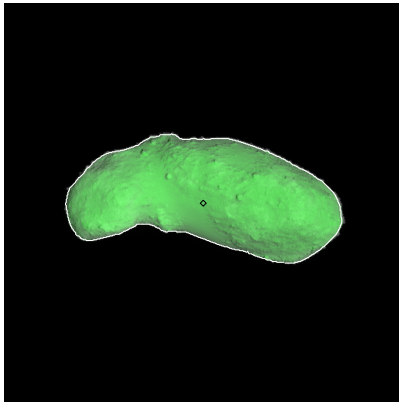


Figure 404:
ST_2423116667_v.fits



Figure 405:
ST_2423124875_v.fits



Figure 406:
ST_2423133051_v.fits

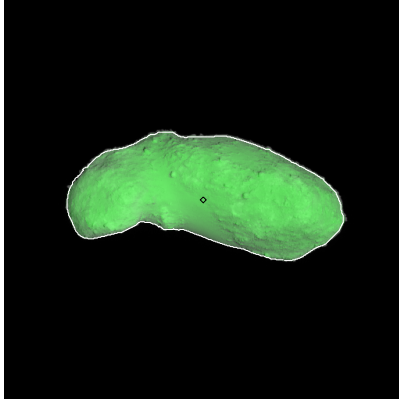


Figure 407:
ST_2423141242_v.fits

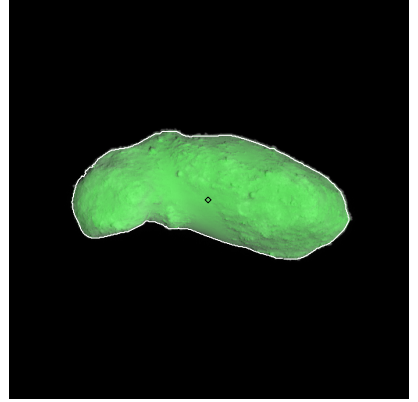


Figure 408:
ST_2423149450_v.fits

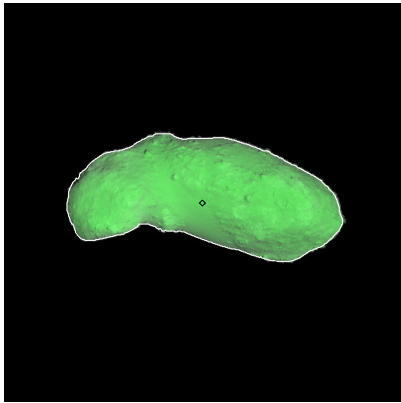


Figure 409:
ST_2423157625_v.fits

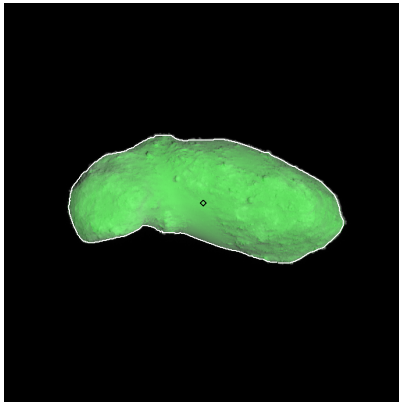


Figure 410:
ST_2423165817_v.fits

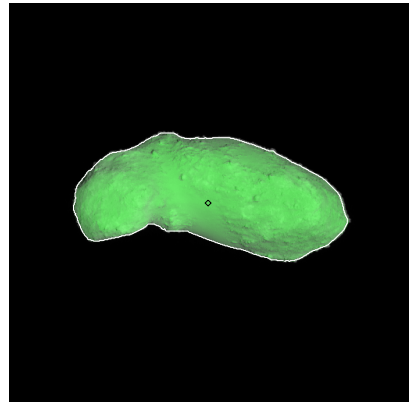


Figure 411:
ST_2423174025_v.fits

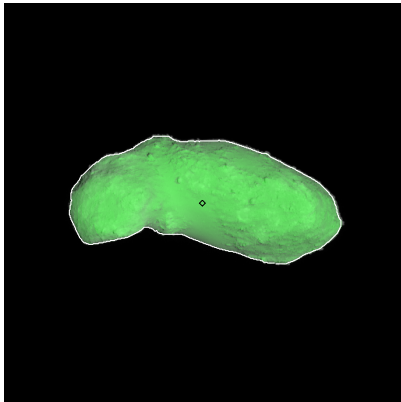


Figure 412:
ST_2423182200_v.fits

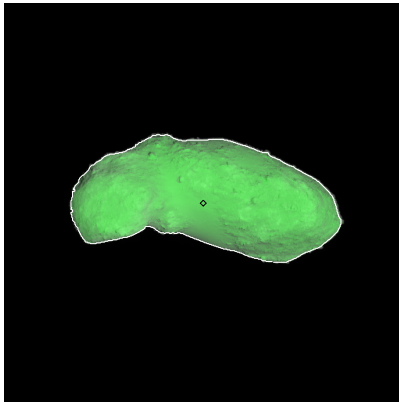


Figure 413:
ST_2423190392_v.fits

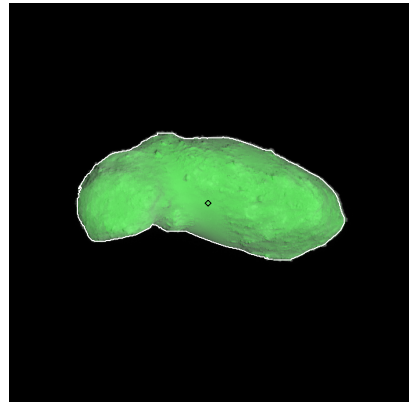


Figure 414:
ST_2423198600_v.fits

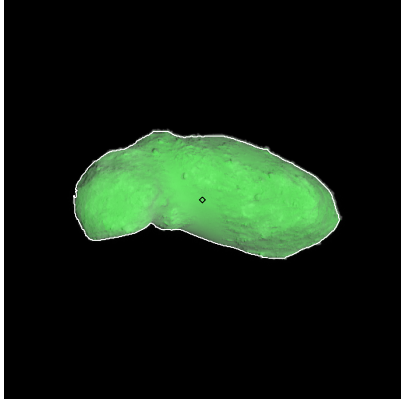


Figure 415:
ST_2423206775_v.fits

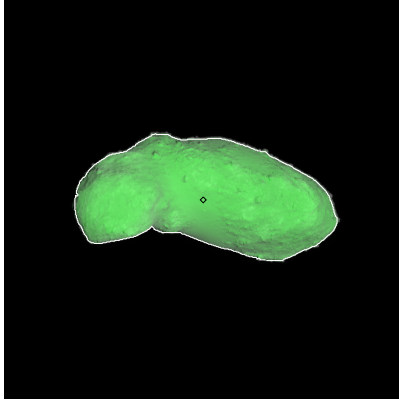


Figure 416:
ST_2423214967_v.fits

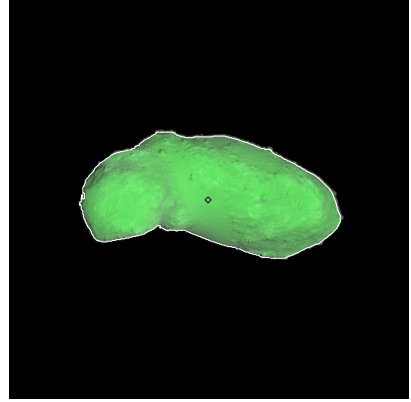


Figure 417:
ST_2423223175_v.fits

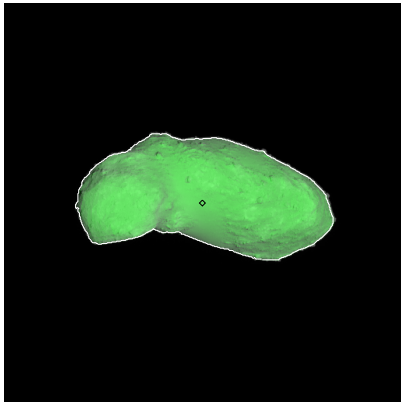


Figure 418:
ST_2423231350_v.fits

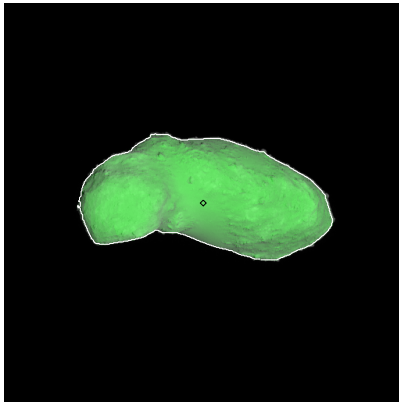


Figure 419:
ST_2423239542_v.fits

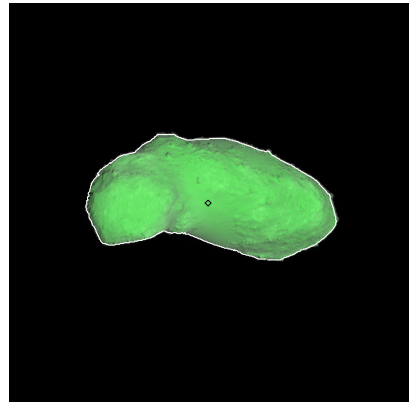


Figure 420:
ST_2423247750_v.fits

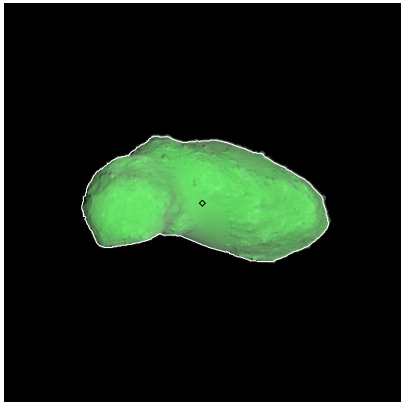


Figure 421:
ST_2423255925_v.fits

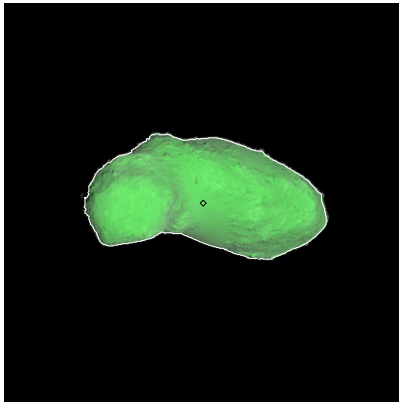


Figure 422:
ST_2423264117_v.fits

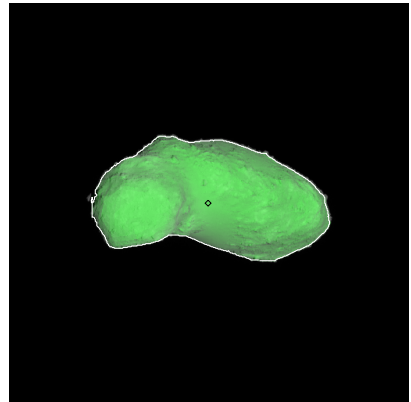


Figure 423:
ST_2423272325_v.fits

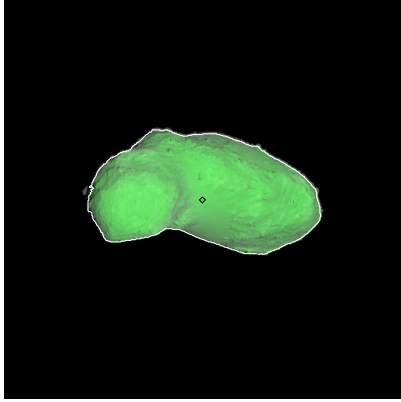


Figure 424:
ST_2423280484_v.fits

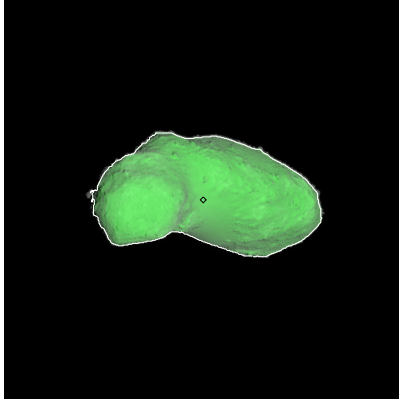


Figure 425:
ST_2423288676_v.fits

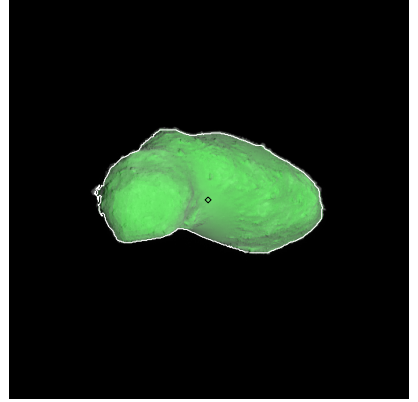


Figure 426:
ST_2423296901_v.fits

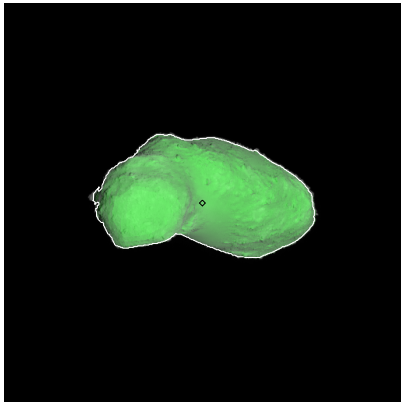


Figure 427:
ST_2423305060_v.fits

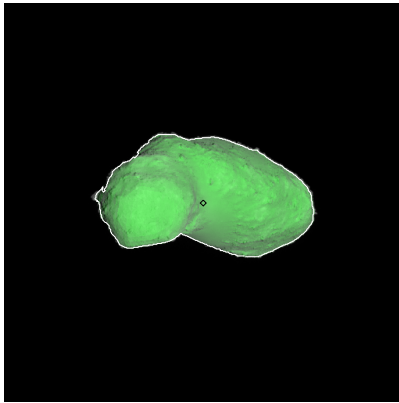


Figure 428:
ST_2423313252_v.fits

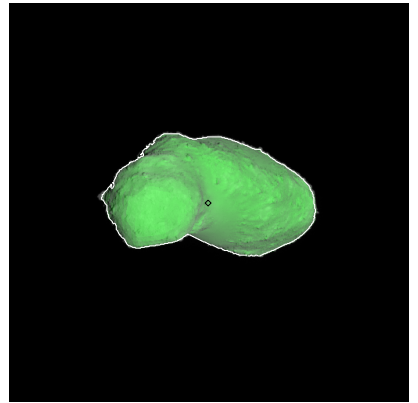


Figure 429:
ST_2423321460_v.fits

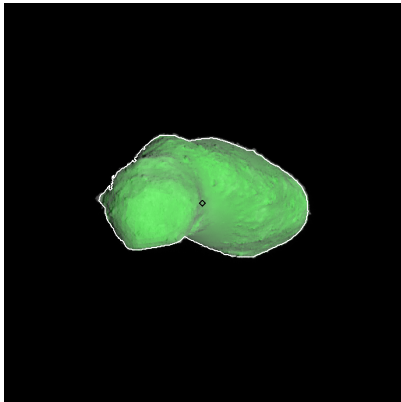


Figure 430:
ST_2423329635_v.fits

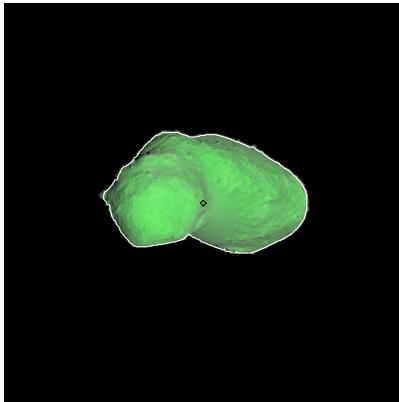


Figure 431:
ST_2423337827_v.fits

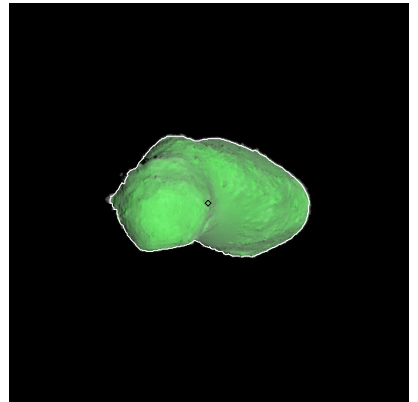


Figure 432:
ST_2423346019_v.fits

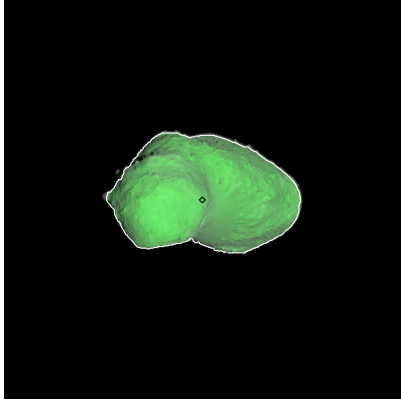


Figure 433:
ST_2423354210_v.fits

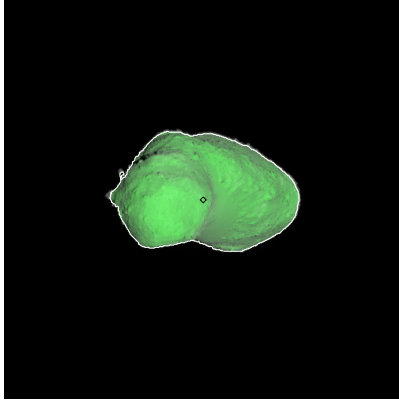


Figure 434:
ST_2423362402_v.fits

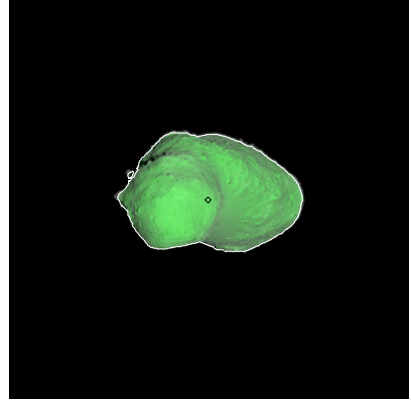


Figure 435:
ST_2423370577_v.fits

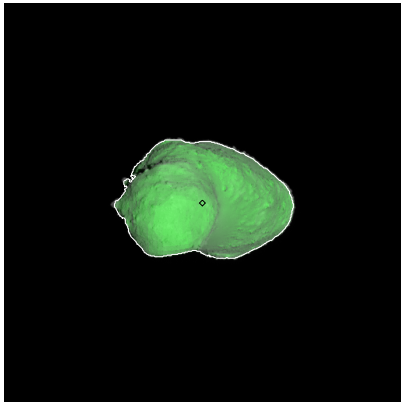


Figure 436:
ST_2423378786_v.fits

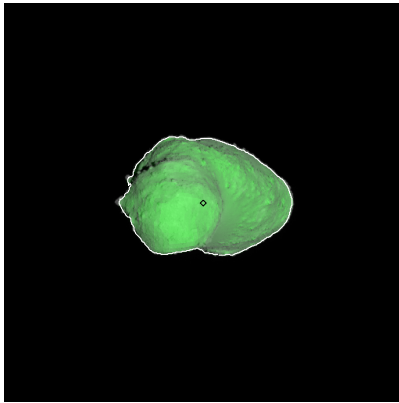


Figure 437:
ST_2423386961_v.fits

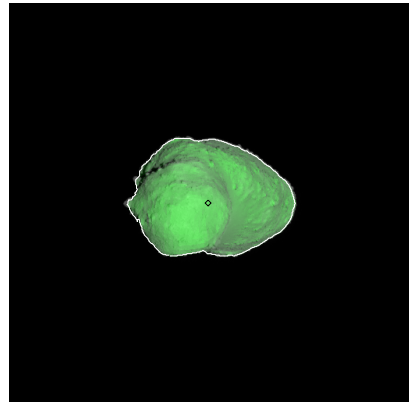


Figure 438:
ST_2423395153_v.fits

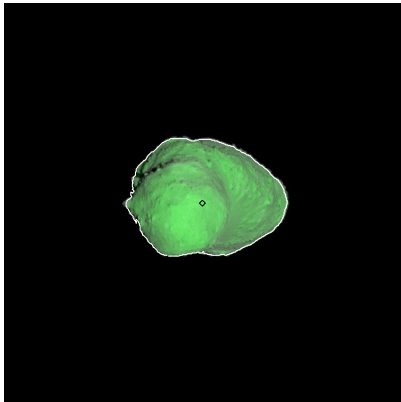


Figure 439:
ST_2423403328_v.fits

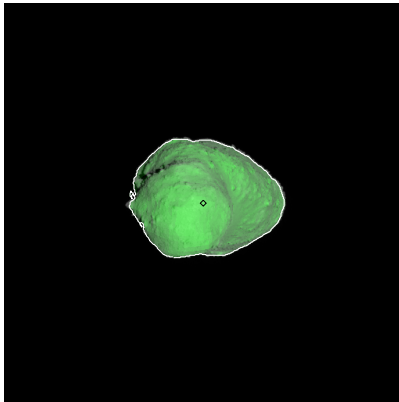


Figure 440:
ST_2423411536_v.fits

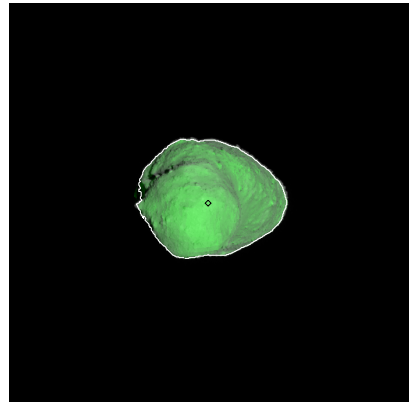


Figure 441:
ST_2423419728_v.fits

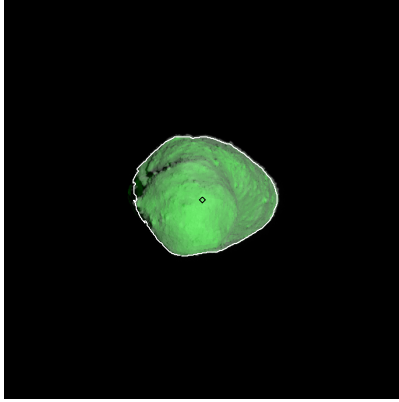


Figure 442:
ST_2423427887_v.fits

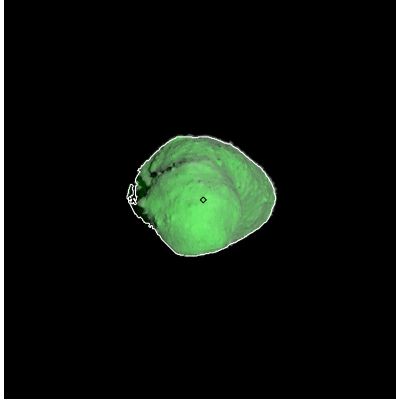


Figure 443:
ST_2423436111_v.fits

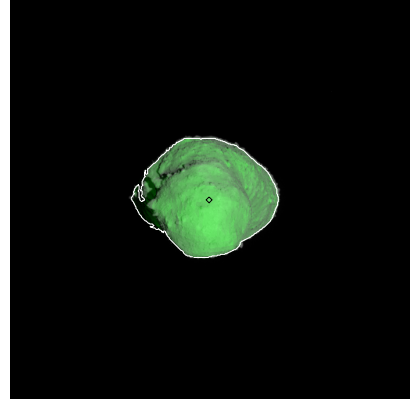


Figure 444:
ST_2423444287_v.fits

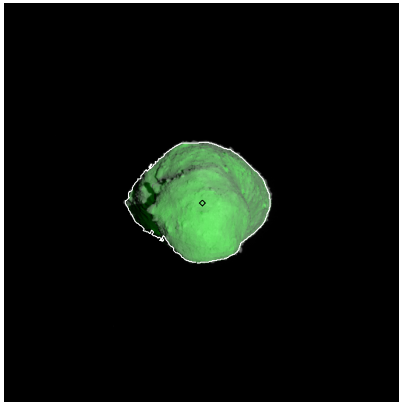


Figure 445:
ST_2423452462_v.fits

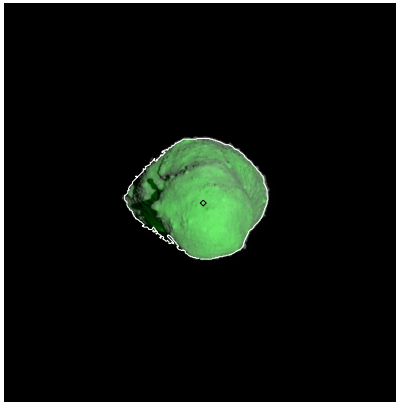


Figure 446:
ST_2423460670_v.fits

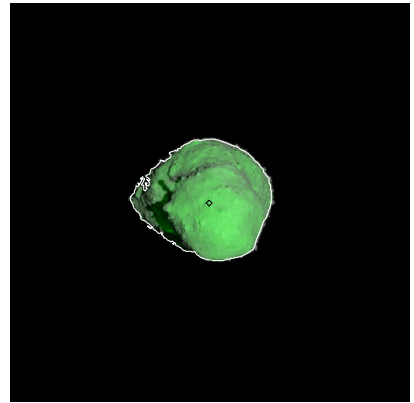


Figure 447:
ST_2423468862_v.fits

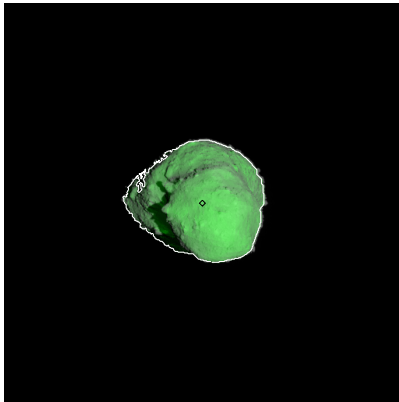


Figure 448:
ST_2423477037_v.fits

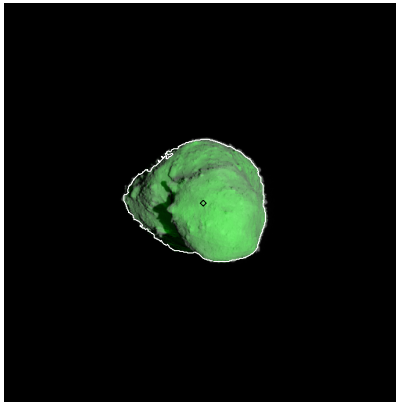


Figure 449:
ST_2423485261_v.fits

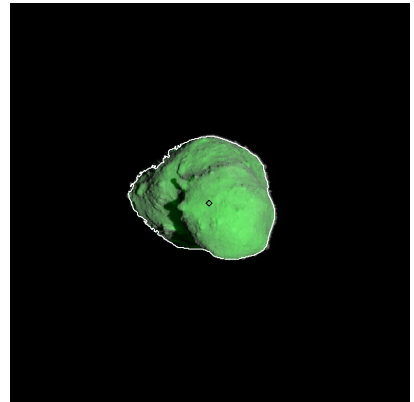


Figure 450:
ST_2423493437_v.fits

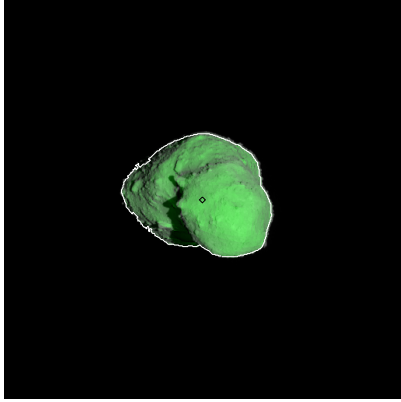


Figure 451:
ST_2423501628_v.fits

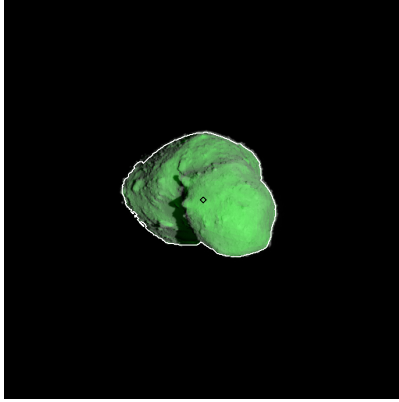


Figure 452:
ST_2423509836_v.fits

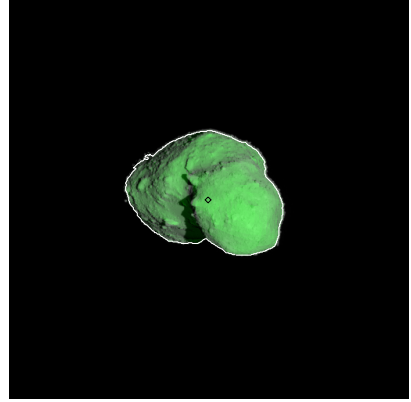


Figure 453:
ST_2423518028_v.fits

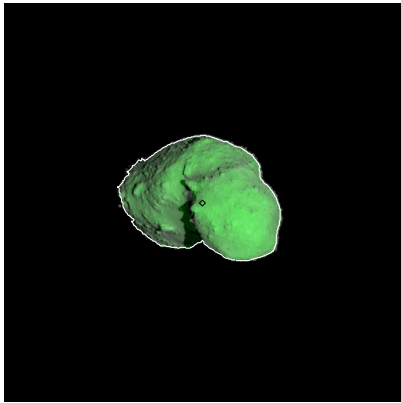


Figure 454:
ST_2423526203_v.fits

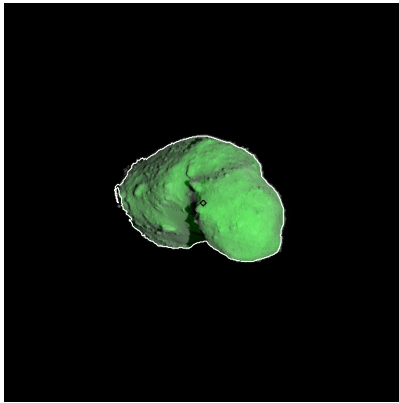


Figure 455:
ST_2423534411_v.fits

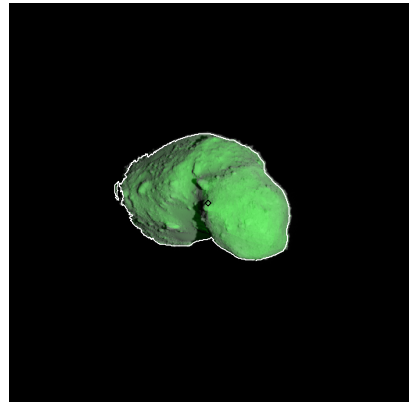


Figure 456:
ST_2423542603_v.fits

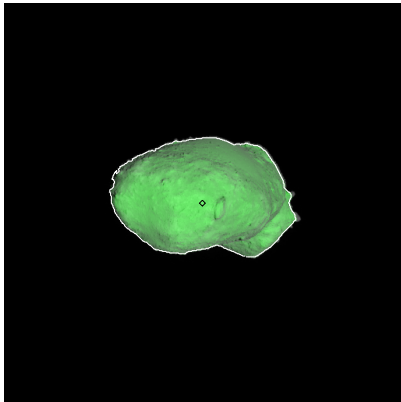


Figure 457:
ST_2424058721_v.fits

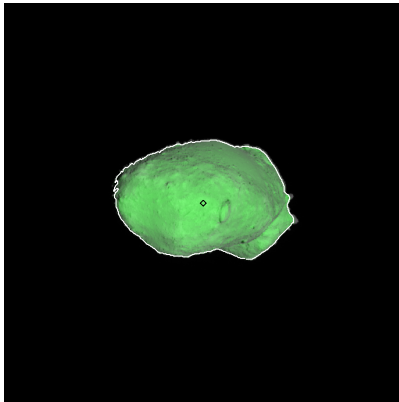


Figure 458:
ST_2424066880_v.fits

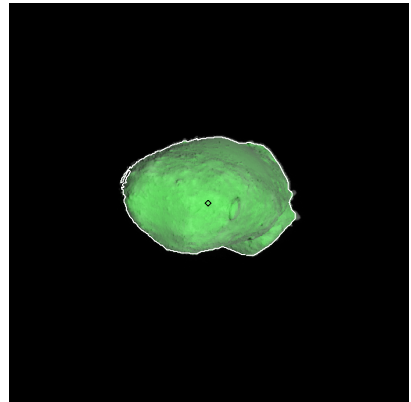


Figure 459:
ST_2424075088_v.fits

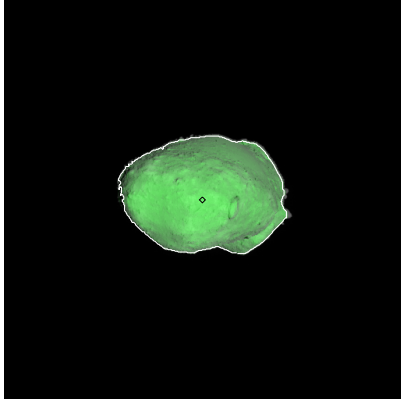


Figure 460:
ST_2424083280_v.fits

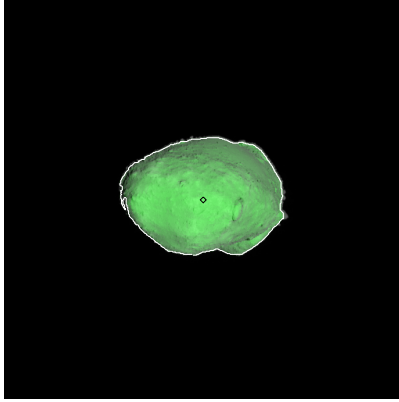


Figure 461:
ST_2424091455_v.fits

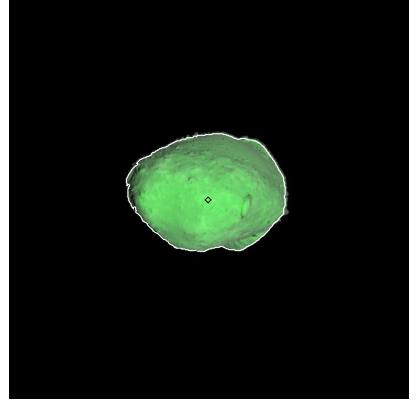


Figure 462:
ST_2424099663_v.fits

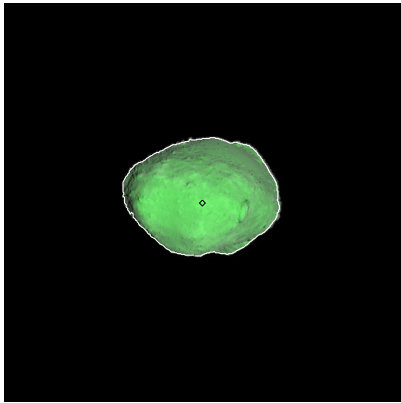


Figure 463:
ST_2424107855_v.fits

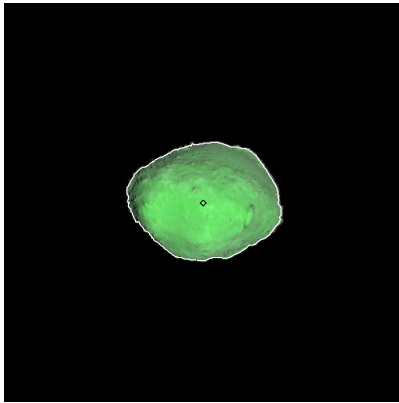


Figure 464:
ST_2424116014_v.fits

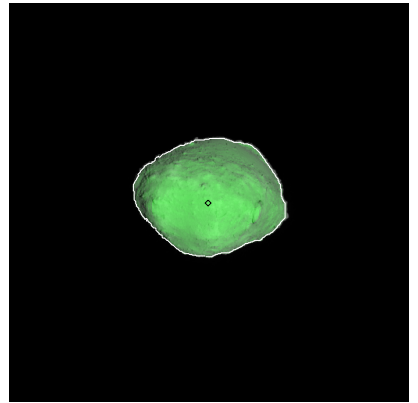


Figure 465:
ST_2424124238_v.fits

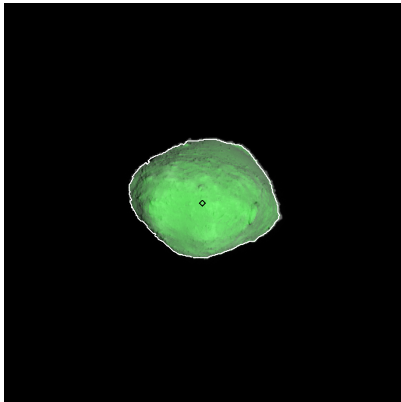


Figure 466:
ST_2424132430_v.fits

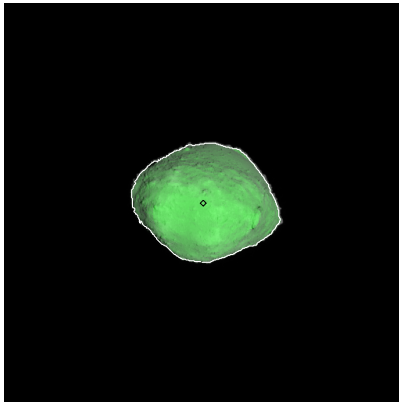


Figure 467:
ST_2424140605_v.fits

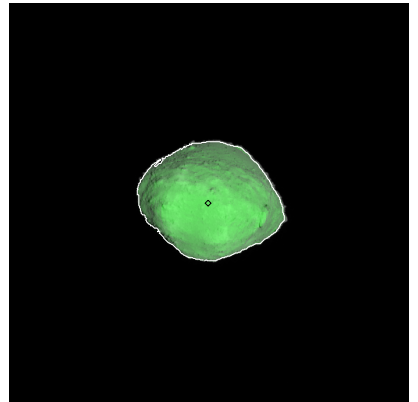


Figure 468:
ST_2424148813_v.fits

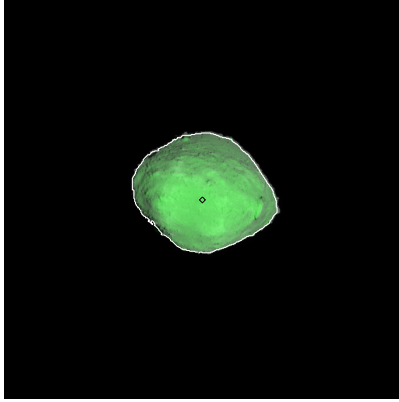


Figure 469:
ST_2424157005_v.fits

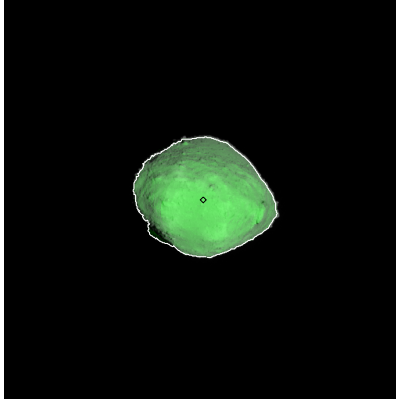


Figure 470:
ST_2424165164_v.fits

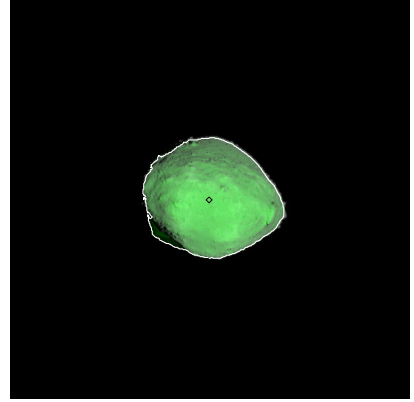


Figure 471:
ST_2424173388_v.fits

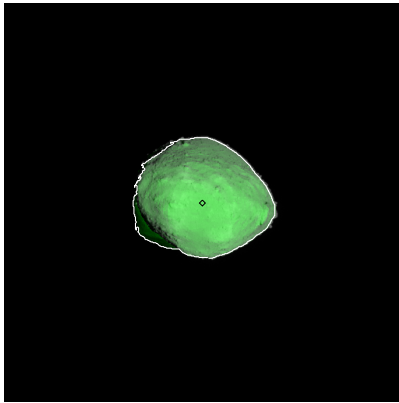


Figure 472:
ST_2424181580_v.fits

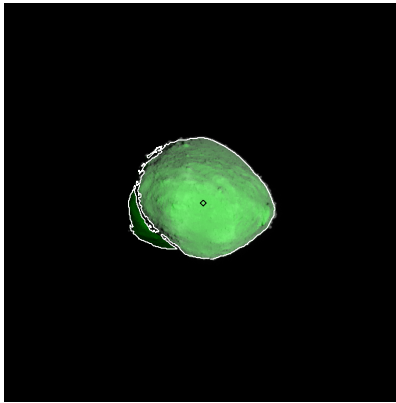


Figure 473:
ST_2424189738_v.fits

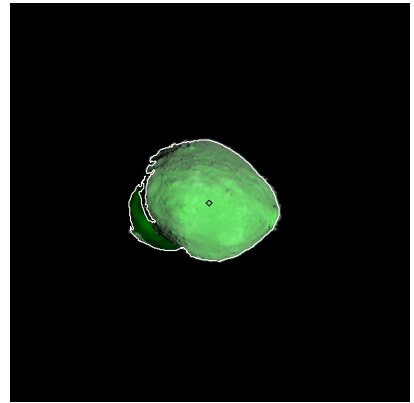


Figure 474:
ST_2424197963_v.fits

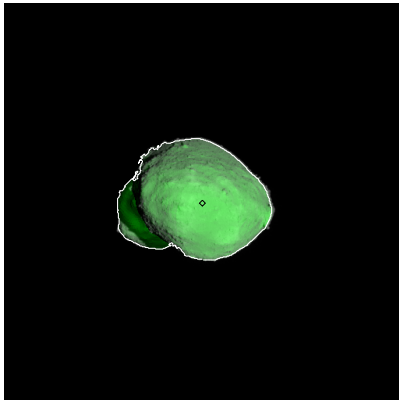


Figure 475:
ST_2424206154_v.fits

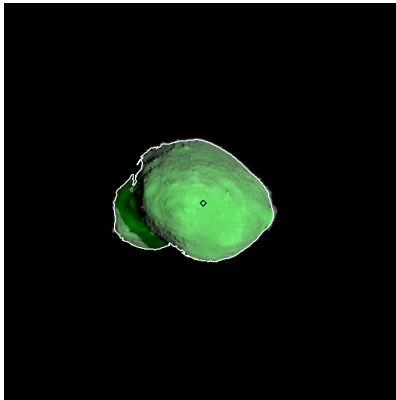


Figure 476:
ST_2424214329_v.fits

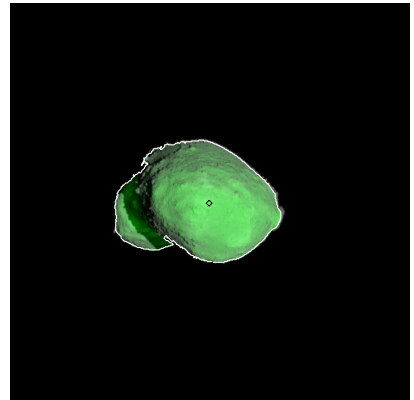


Figure 477:
ST_242422537_v.fits

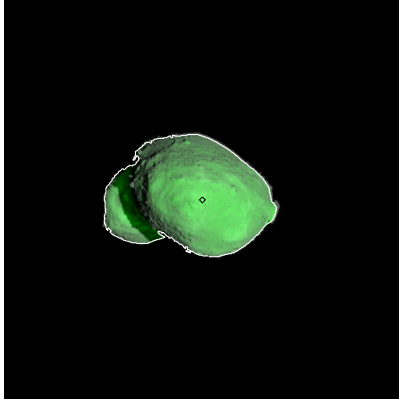


Figure 478:
ST_2424230729_v.fits

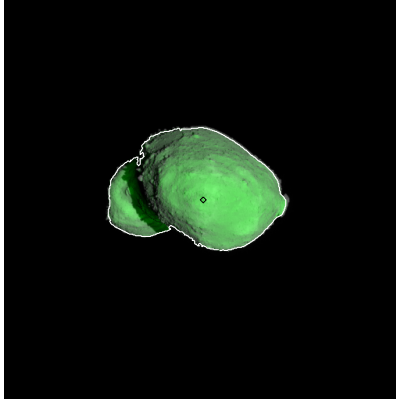


Figure 479:
ST_2424238904_v.fits

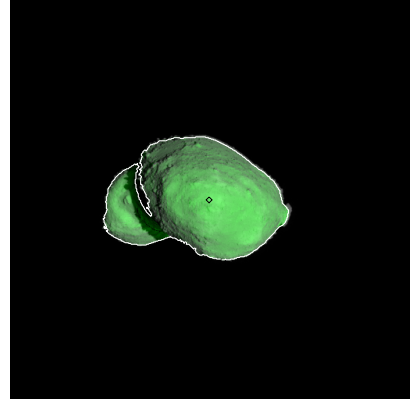


Figure 480:
ST_2424247128_v.fits

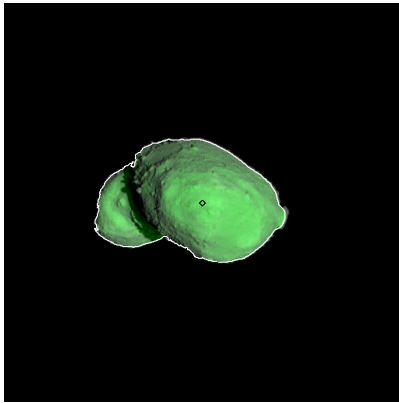


Figure 481:
ST_2424255320_v.fits

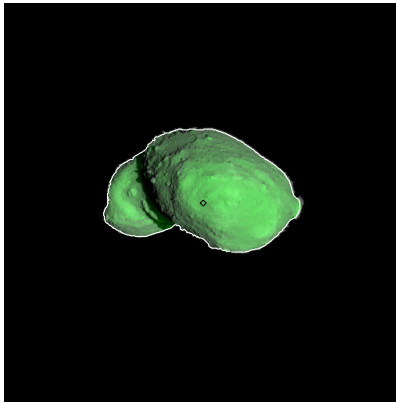


Figure 482:
ST_2424263495_v.fits

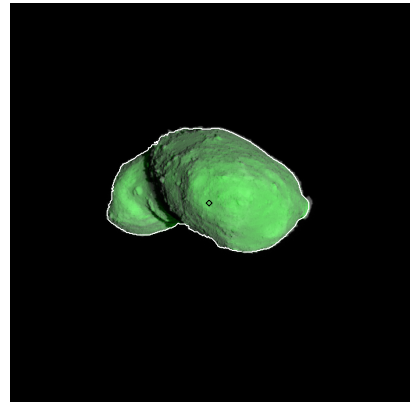


Figure 483:
ST_2424271703_v.fits

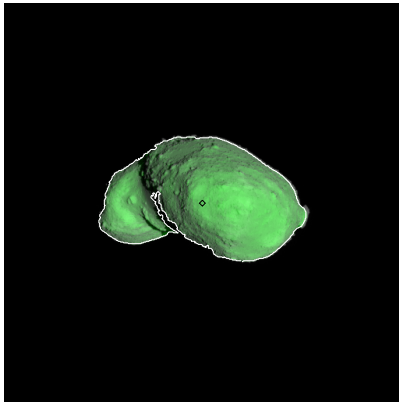


Figure 484:
ST_2424279895_v.fits

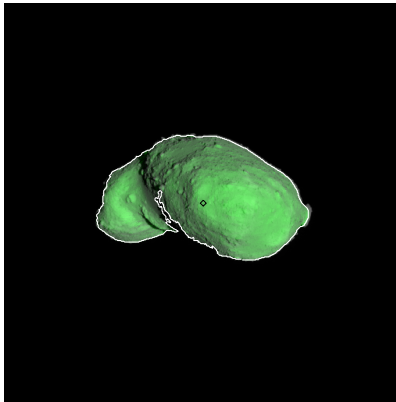


Figure 485:
ST_2424288087_v.fits

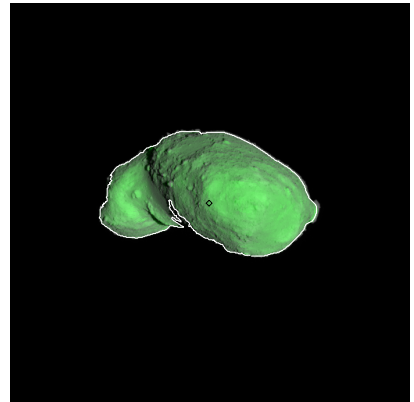


Figure 486:
ST_2424296278_v.fits

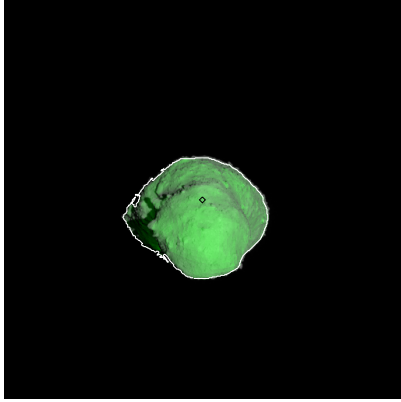


Figure 487:
ST_2426245955_v.fits

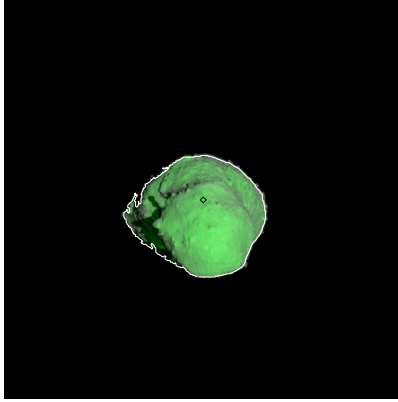


Figure 488:
ST_2426254131_v.fits

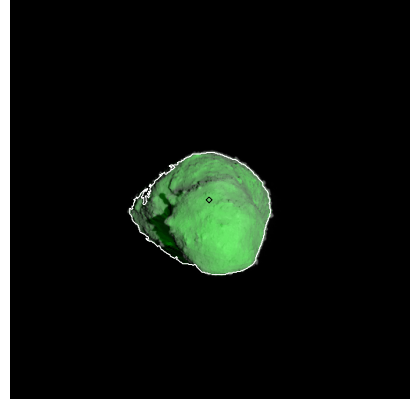


Figure 489:
ST_2426262322_v.fits

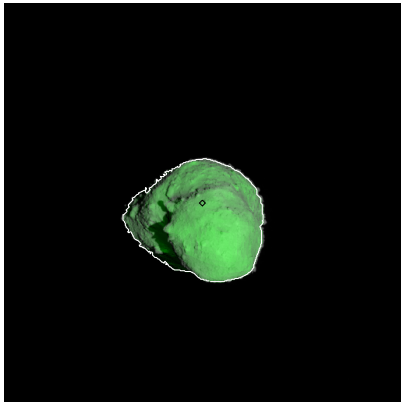


Figure 490:
ST_2426270530_v.fits

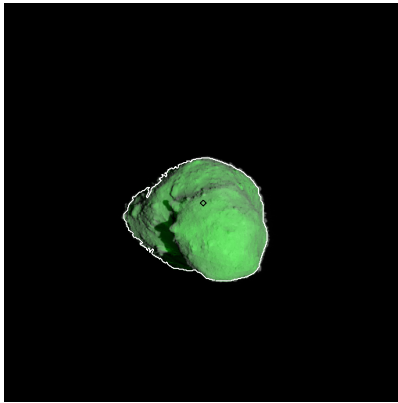


Figure 491:
ST_2426278706_v.fits

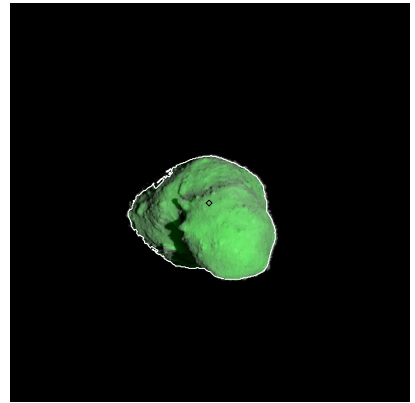


Figure 492:
ST_2426286914_v.fits

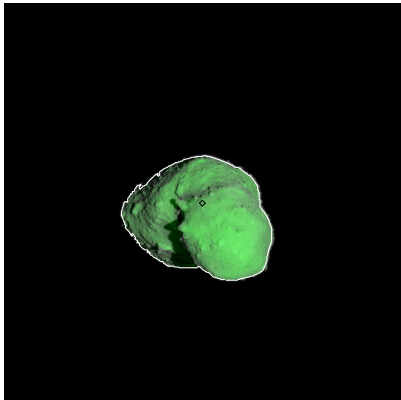


Figure 493:
ST_2426295105_v.fits

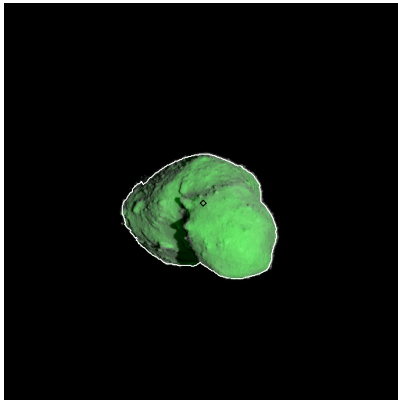


Figure 494:
ST_2426303280_v.fits

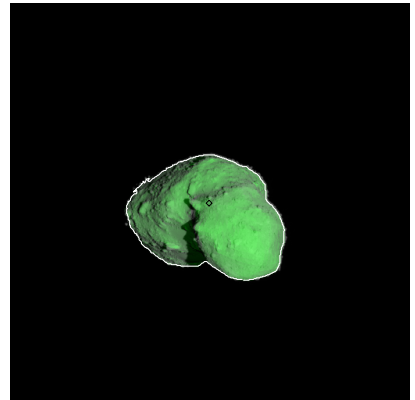


Figure 495:
ST_2426311505_v.fits

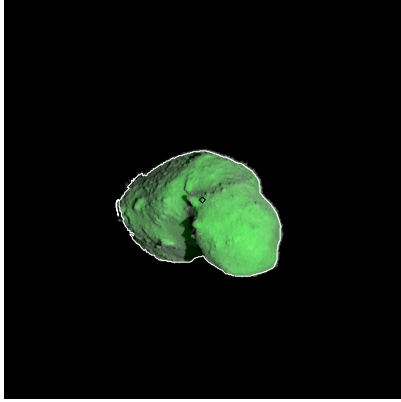


Figure 496:
ST_2426319696_v.fits

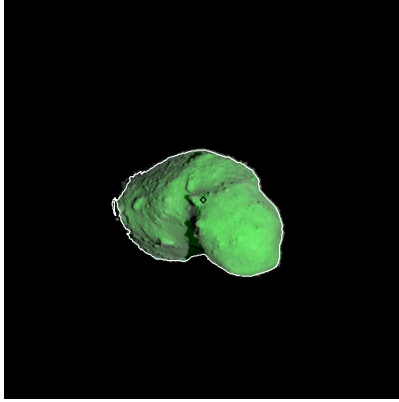


Figure 497:
ST_2426327872_v.fits

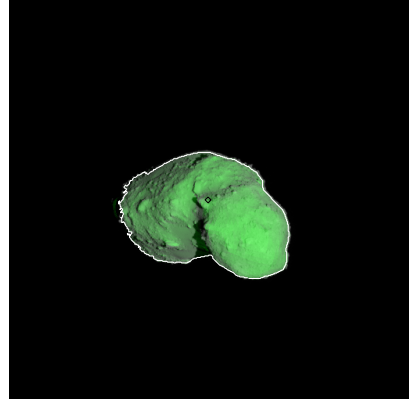


Figure 498:
ST_2426336096_v.fits

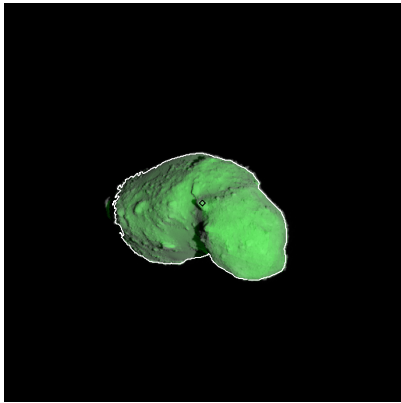


Figure 499:
ST_2426344271_v.fits

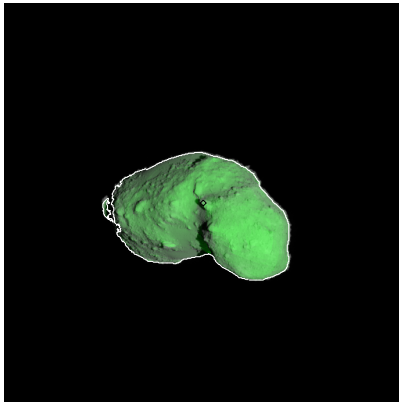


Figure 500:
ST_2426352463_v.fits

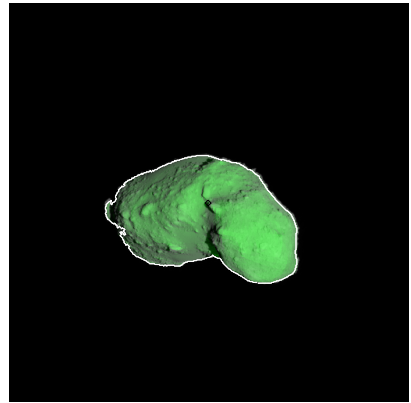


Figure 501:
ST_2426360671_v.fits

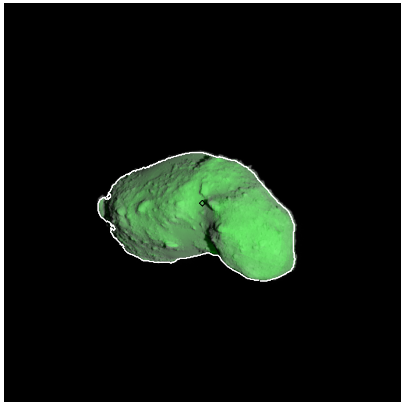


Figure 502:
ST_2426368862_v.fits

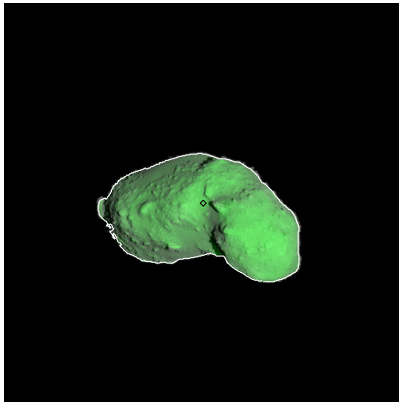


Figure 503:
ST_2426377038_v.fits

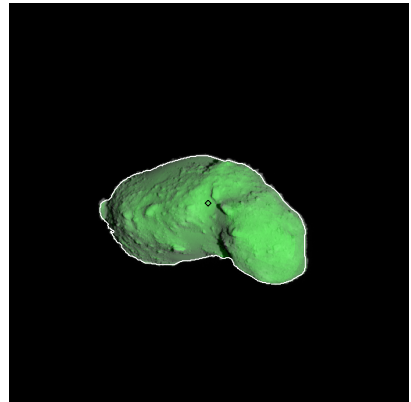


Figure 504:
ST_2426385246_v.fits

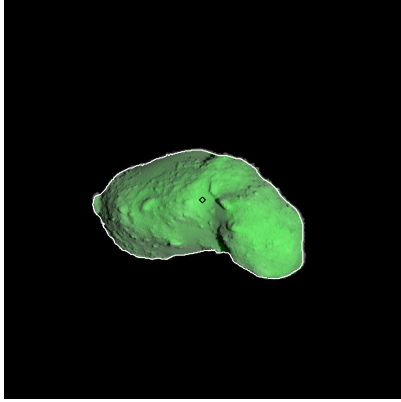


Figure 505:
ST_2426393454_v.fits

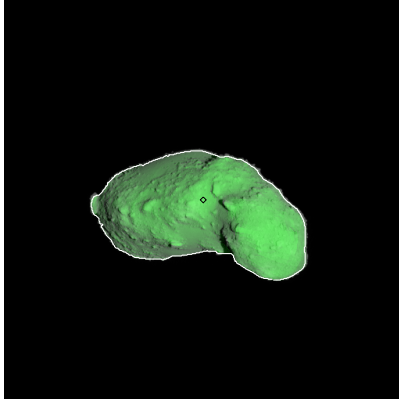


Figure 506:
ST_2426401645_v.fits

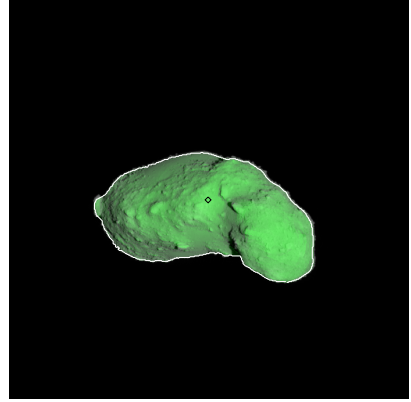


Figure 507:
ST_2426409837_v.fits

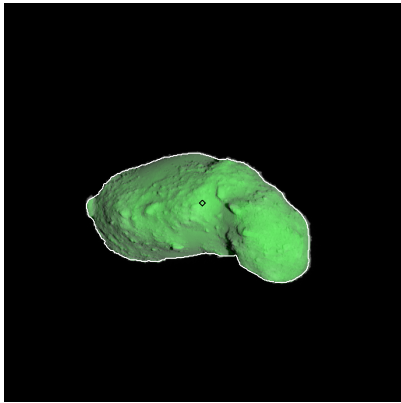


Figure 508:
ST_2426418029_v.fits

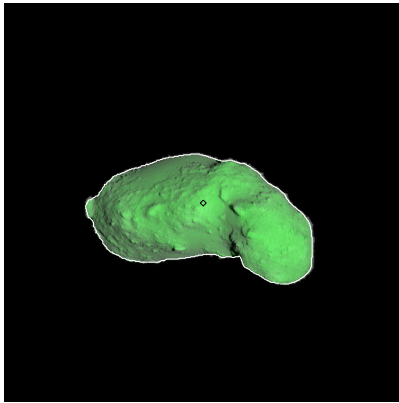


Figure 509:
ST_2426426220_v.fits

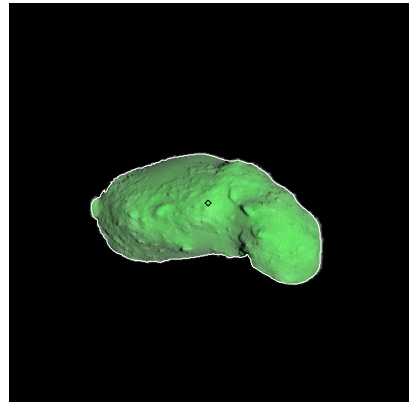


Figure 510:
ST_2426434412_v.fits

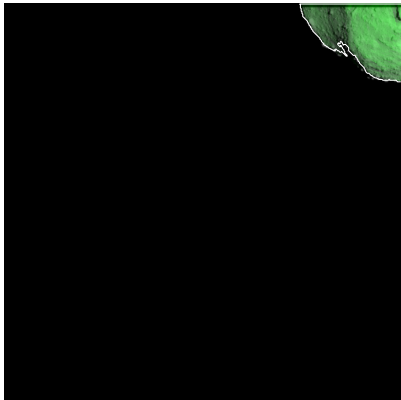


Figure 511:
ST_2430878748_v.fits

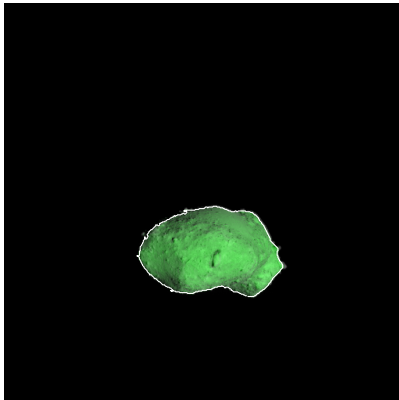


Figure 512:
ST_2444259813_v.fits



Figure 513:
ST_2444266629_v.fits

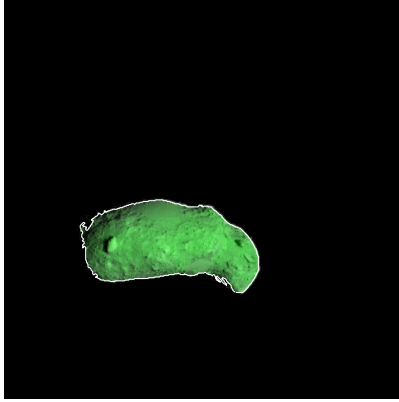


Figure 514:
ST_2445001074_v.fits

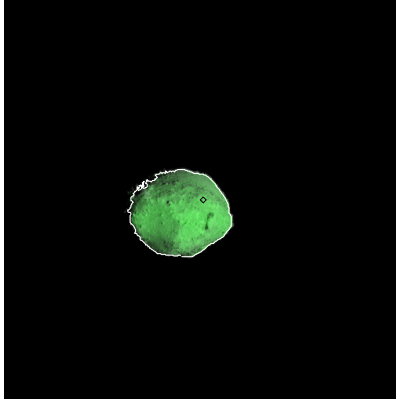


Figure 515:
ST_2445006811_v.fits

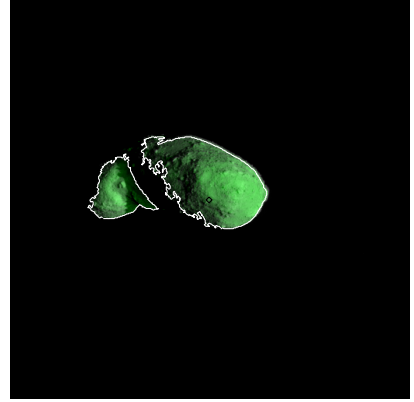


Figure 516:
ST_2445206532_v.fits

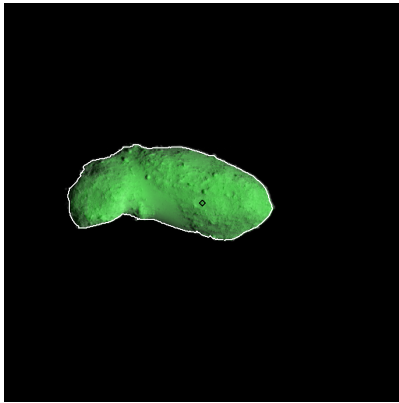


Figure 517:
ST_2445692340_v.fits

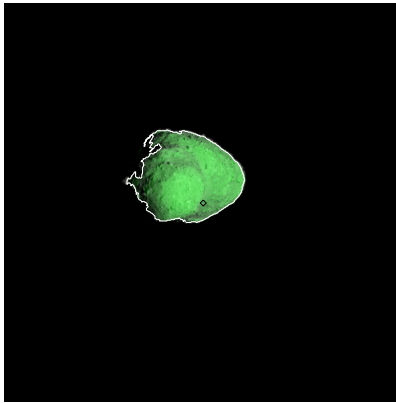


Figure 518:
ST_2445698045_v.fits

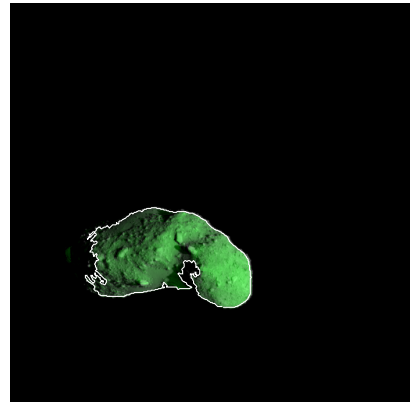


Figure 519:
ST_2445901606_v.fits

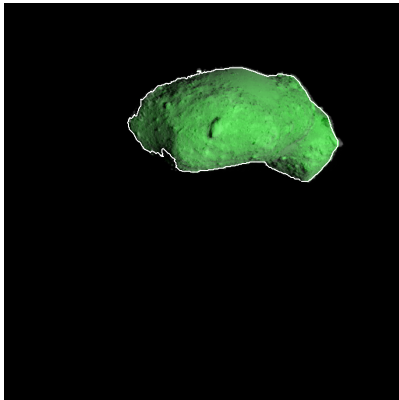


Figure 520:
ST_2447762125_v.fits

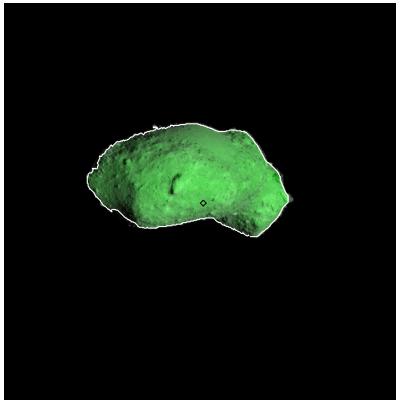


Figure 521:
ST_2447767879_v.fits

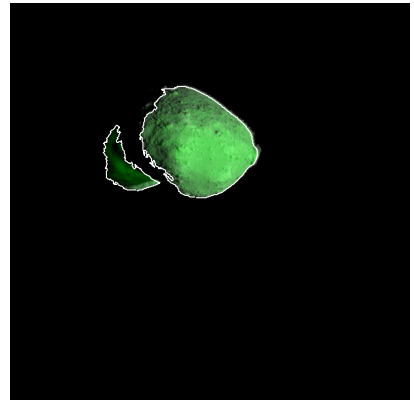


Figure 522:
ST_2447904203_v.fits

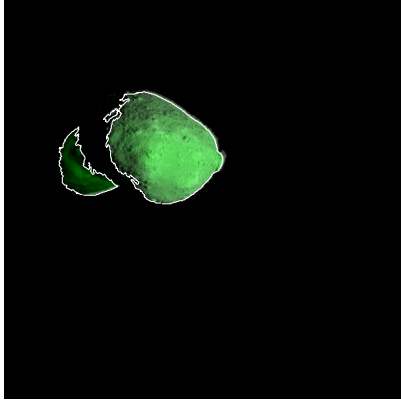


Figure 523:
ST_2447909957_v.fits

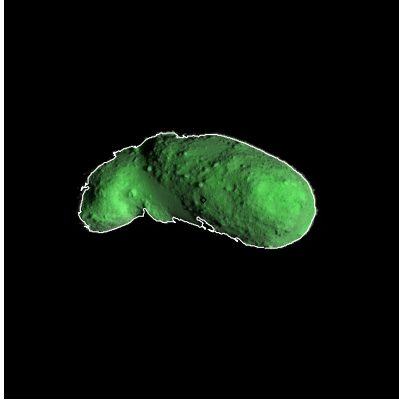


Figure 524:
ST_2448061671_v.fits



Figure 525:
ST_2448357351_v.fits

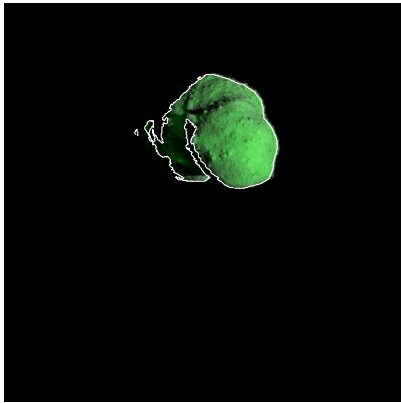


Figure 526:
ST_2448576189_v.fits

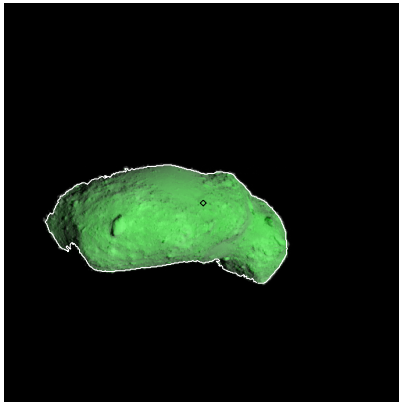


Figure 527:
ST_2450546219_v.fits

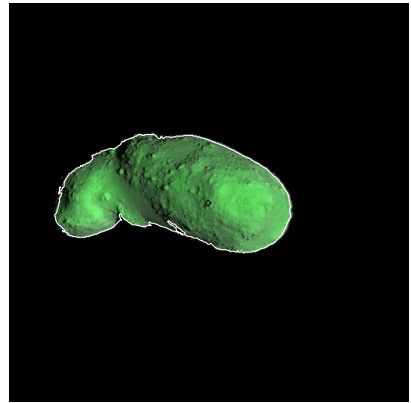


Figure 528:
ST_2450874726_v.fits

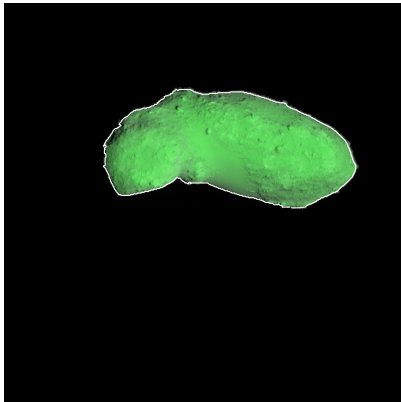


Figure 529:
ST_2451105131_v.fits

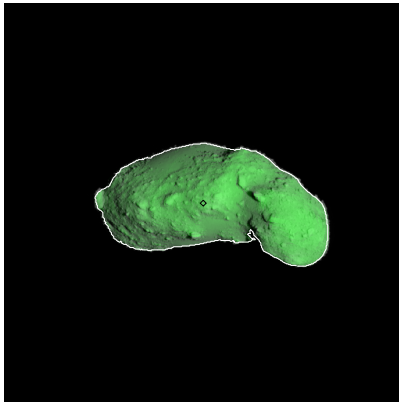


Figure 530:
ST_2451565940_v.fits



Figure 531:
ST_2455809065_v.fits

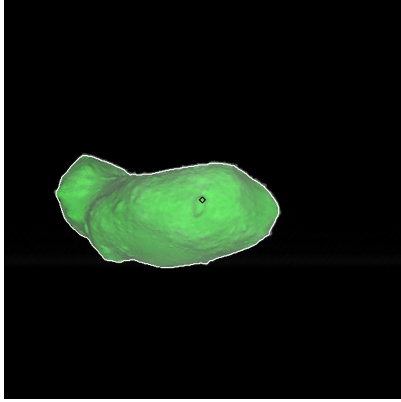


Figure 532:
ST_2456125874_v.fits

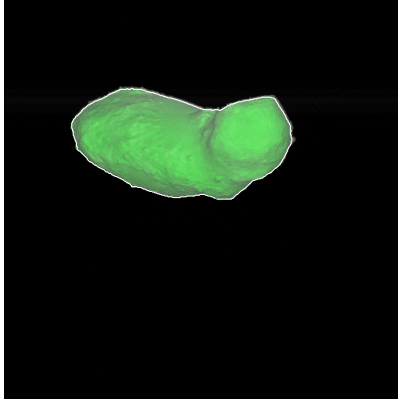


Figure 533:
ST_2456824763_v.fits

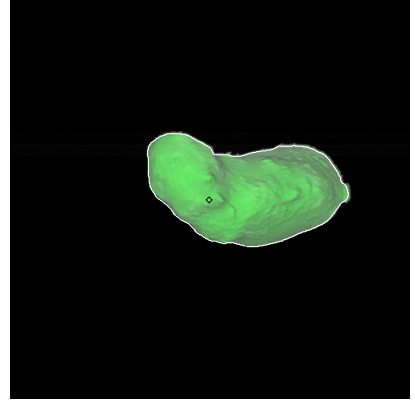


Figure 534:
ST_2458536454_v.fits

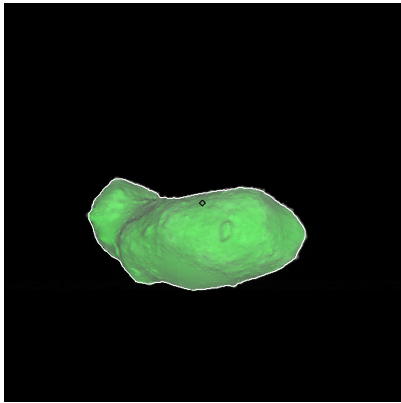


Figure 535:
ST_2458542208_v.fits

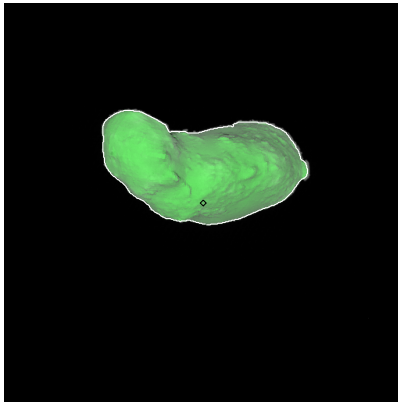


Figure 536:
ST_2458574873_v.fits

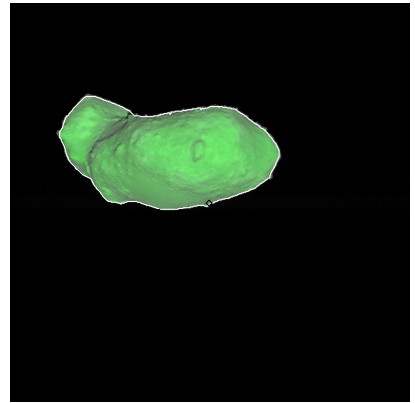


Figure 537:
ST_2458929180_v.fits

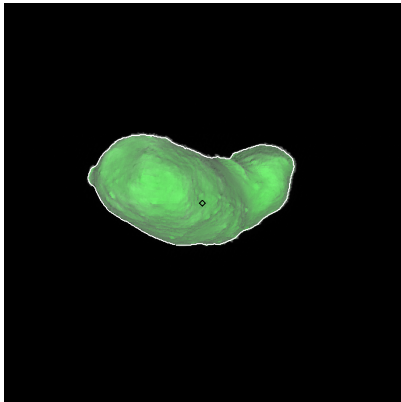


Figure 538:
ST_2459278619_v.fits

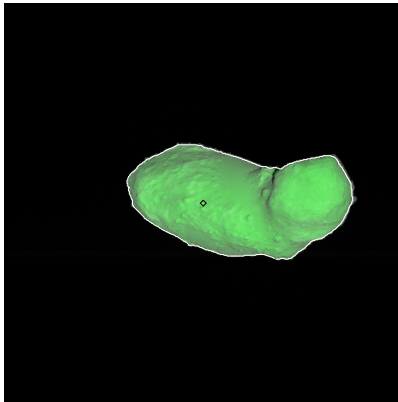


Figure 539:
ST_2459628057_v.fits



Figure 540:
ST_2460326962_v.fits

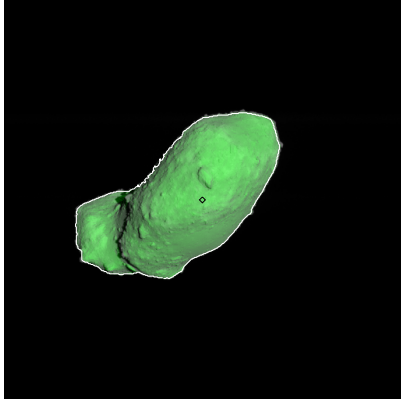


Figure 541:
ST_2461722826_v.fits

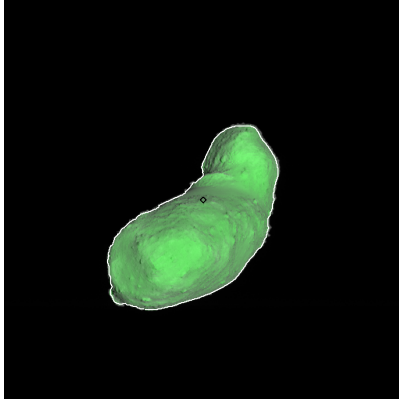


Figure 542:
ST_2462068425_v.fits



Figure 543:
ST_2462414039_v.fits

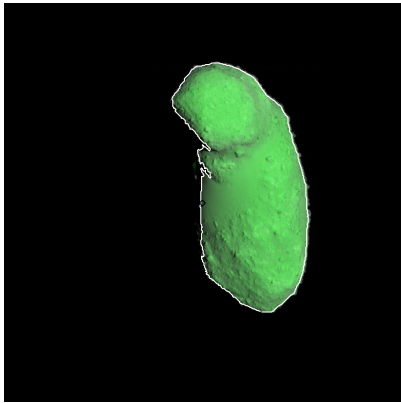


Figure 544:
ST_2465140661_v.fits

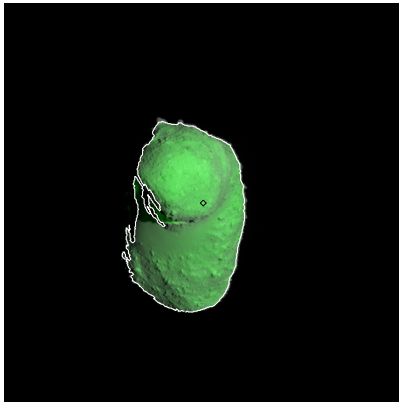


Figure 545:
ST_2465255855_v.fits



Figure 546:
ST_2465735909_v.fits



Figure 547:
ST_2465906756_v.fits

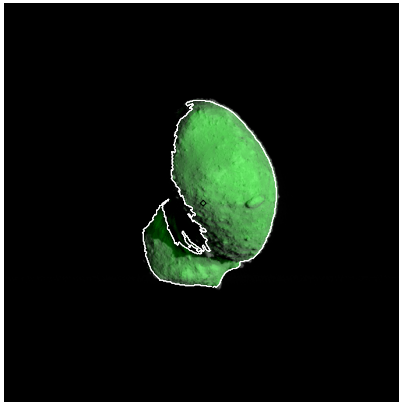


Figure 548:
ST_2467348679_v.fits

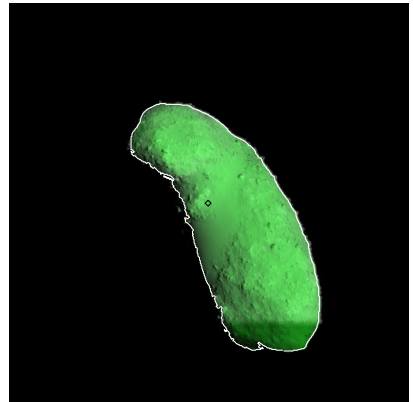


Figure 549:
ST_2467809534_v.fits

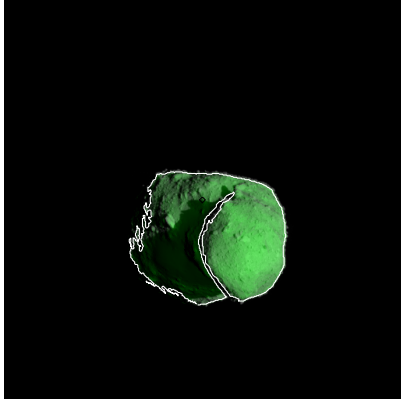


Figure 550:
ST_2468166634_v.fits



Figure 551:
ST_2468500763_v.fits

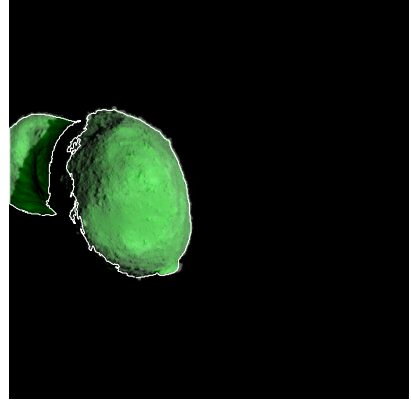


Figure 552:
ST_2470301744_v.fits

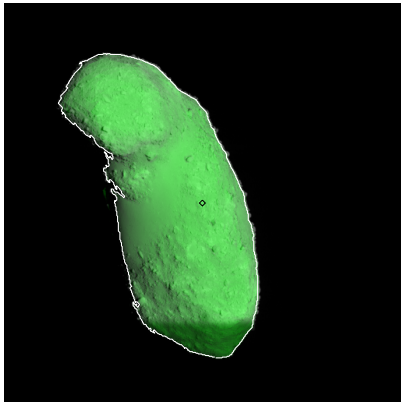


Figure 553:
ST_2470681979_v.fits

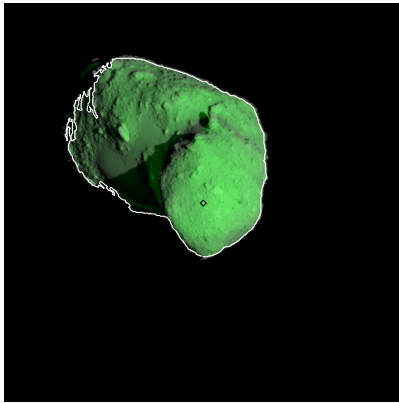


Figure 554:
ST_2471012186_v.fits

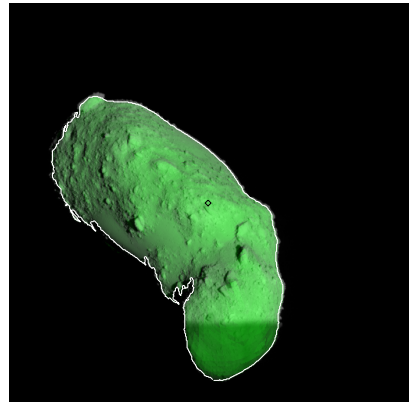


Figure 555:
ST_2471117824_v.fits

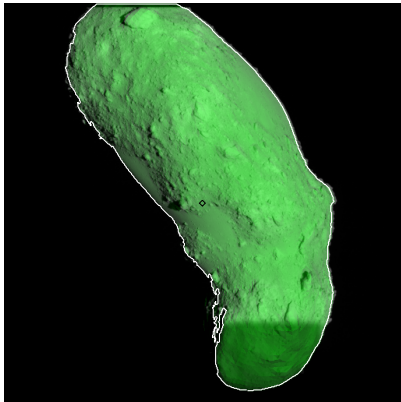


Figure 556:
ST_2472657784_v.fits

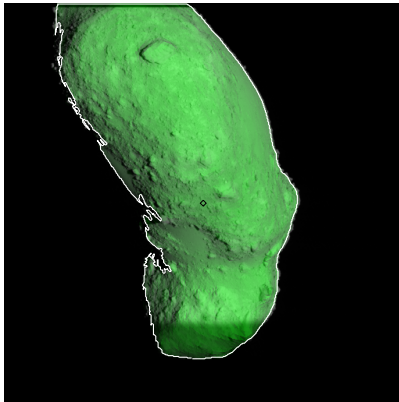


Figure 557:
ST_2472776818_v.fits

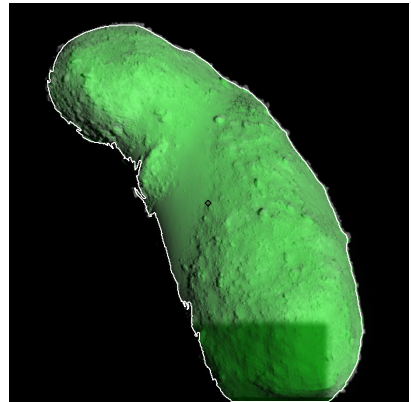


Figure 558:
ST_2473314486_v.fits

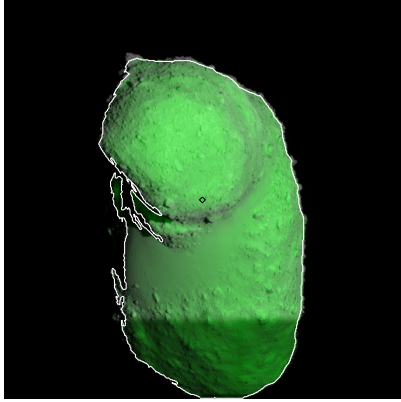


Figure 559:
ST_2473604354_v.fits

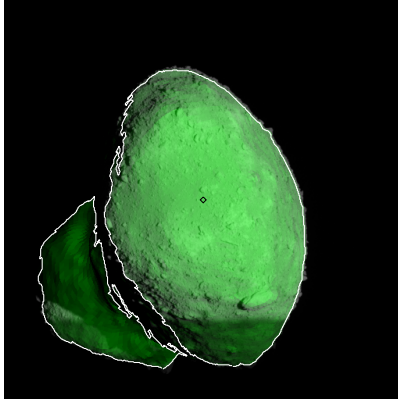


Figure 560:
ST_2474385791_v.fits

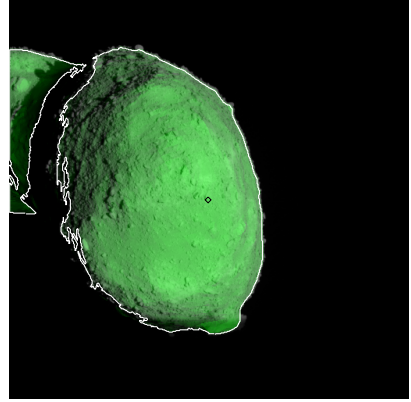


Figure 561:
ST_2474500986_v.fits

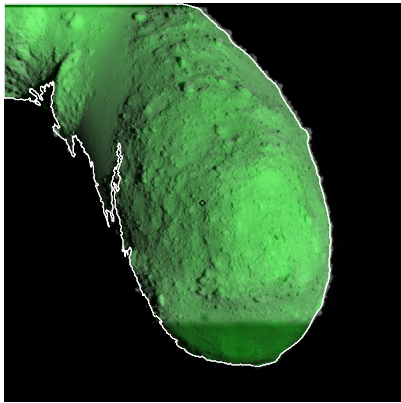


Figure 562:
ST_2474616313_v.fits

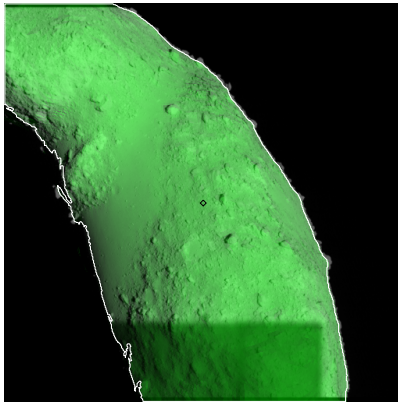


Figure 563:
ST_2474731509_v.fits

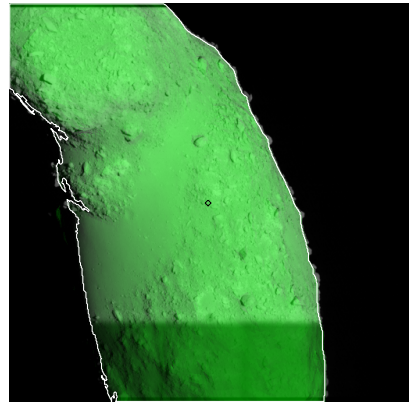


Figure 564:
ST_2474846738_v.fits

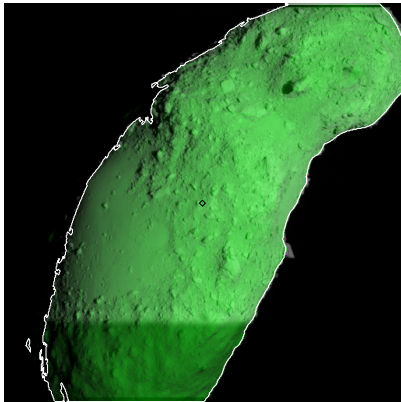


Figure 565:
ST_2480981469_v.fits

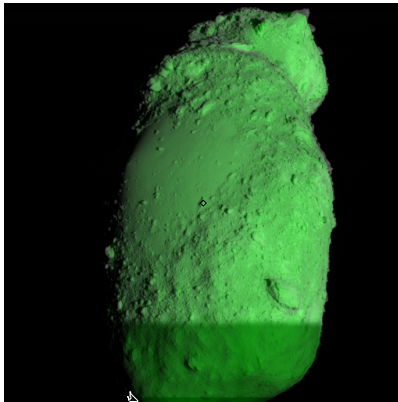


Figure 566:
ST_2481211873_v.fits

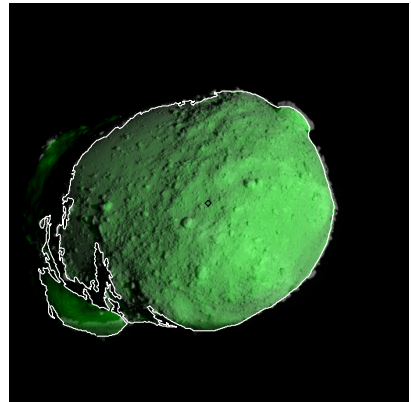


Figure 567:
ST_2481442195_v.fits

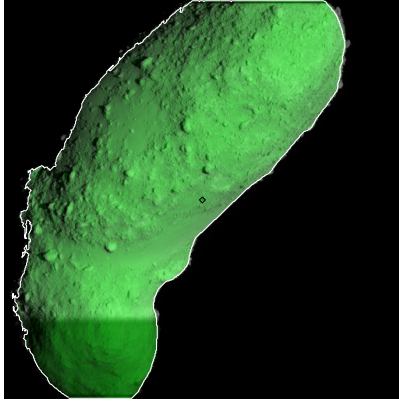


Figure 568:
ST_2481672682_v.fits

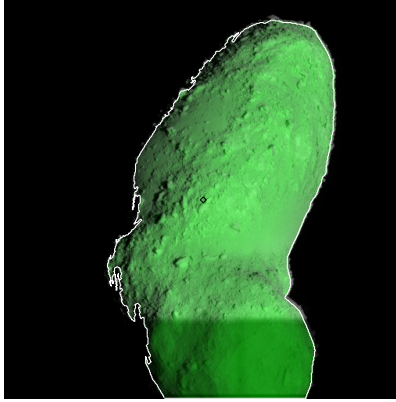


Figure 569:
ST_2481929904_v.fits

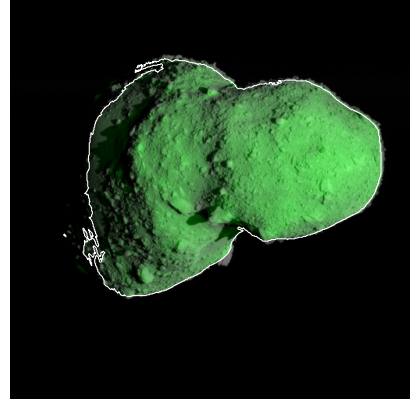


Figure 570:
ST_2482160259_v.fits

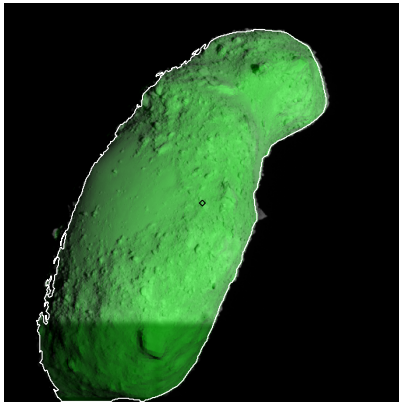


Figure 571:
ST_2483892126_v.fits

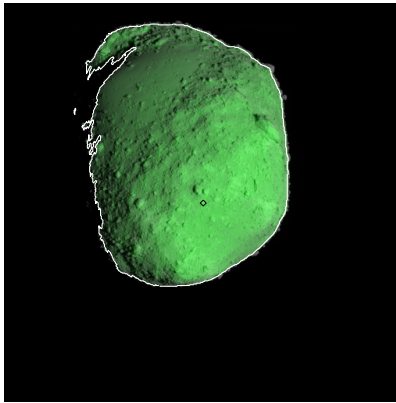


Figure 572:
ST_2484122449_v.fits

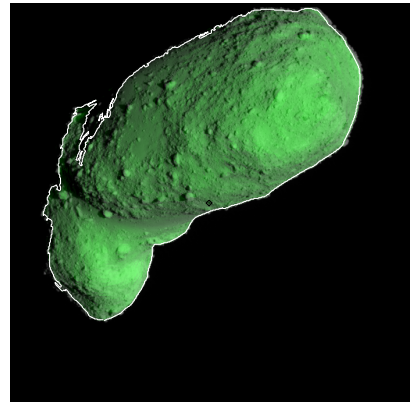


Figure 573:
ST_2484352917_v.fits

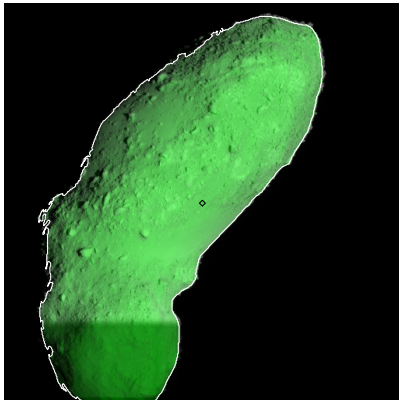


Figure 574:
ST_2484583339_v.fits

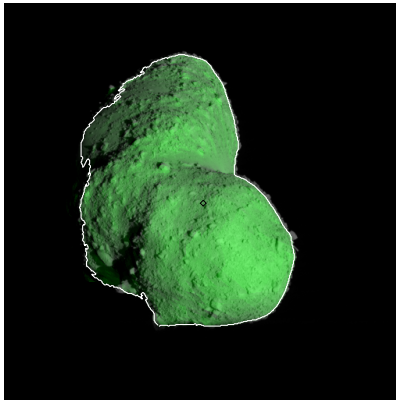


Figure 575:
ST_2484840558_v.fits

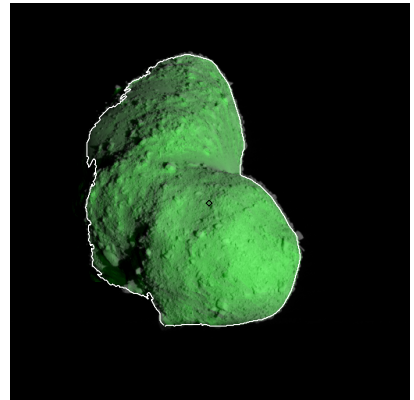


Figure 576:
ST_2484840558_v.fits

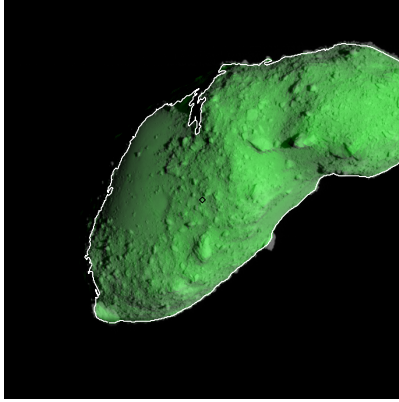


Figure 577:
ST_2485860275_v.fits

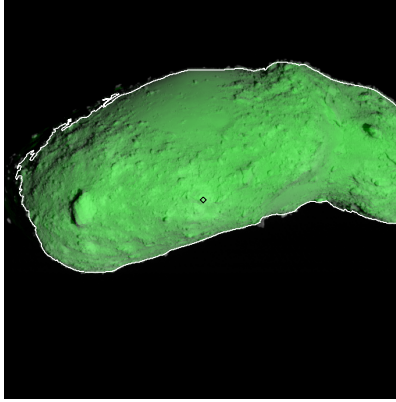


Figure 578:
ST_2489465997_v.fits

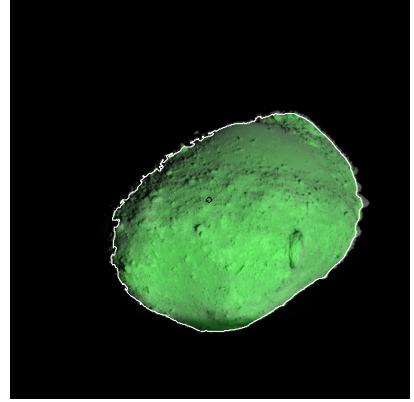


Figure 579:
ST_2489696338_v.fits

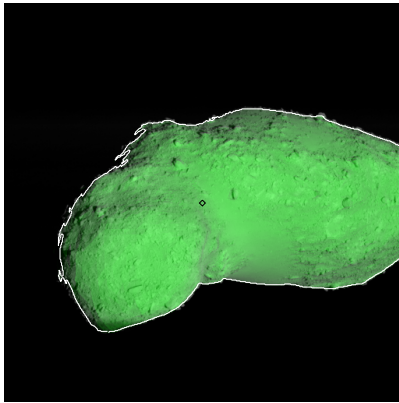


Figure 580:
ST_2490253205_v.fits

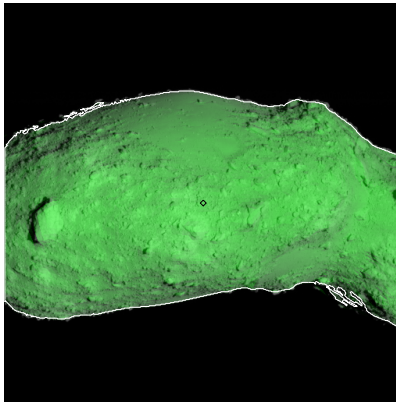


Figure 581:
ST_2492225173_v.fits

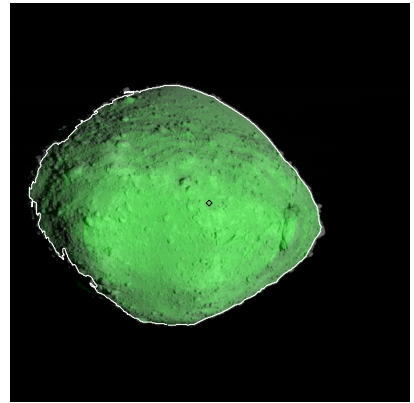


Figure 582:
ST_2492513077_v.fits

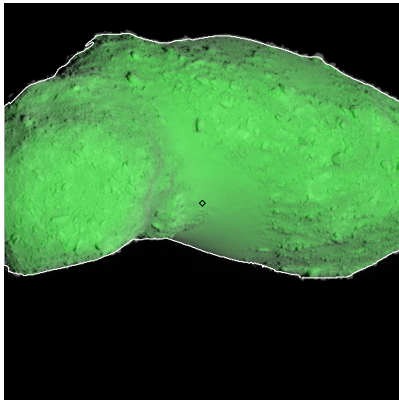


Figure 583:
ST_2493031594_v.fits

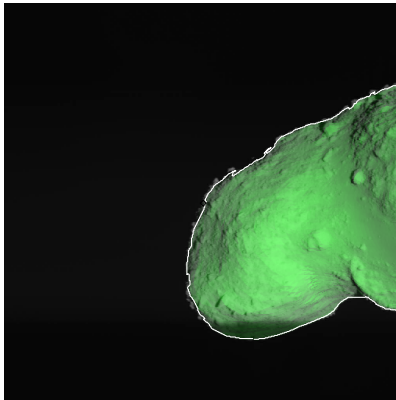


Figure 584:
ST_2494170270_v.fits

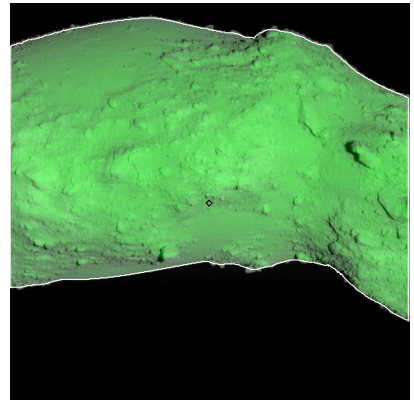


Figure 585:
ST_2494934387_v.fits

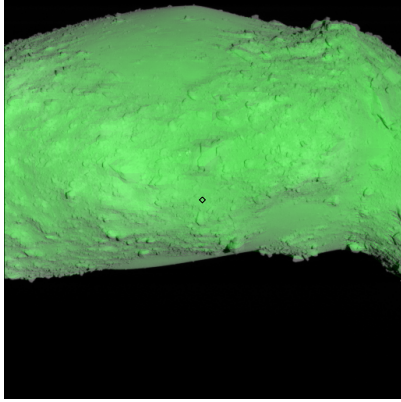


Figure 586:
ST_2494991986_v.fits

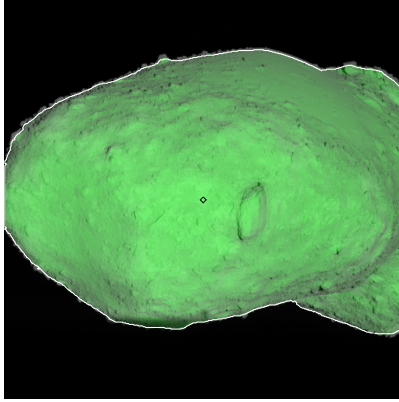


Figure 587:
ST_2495230070_v.fits

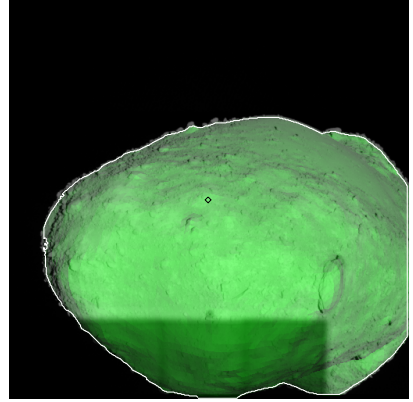


Figure 588:
ST_2495287635_v.fits

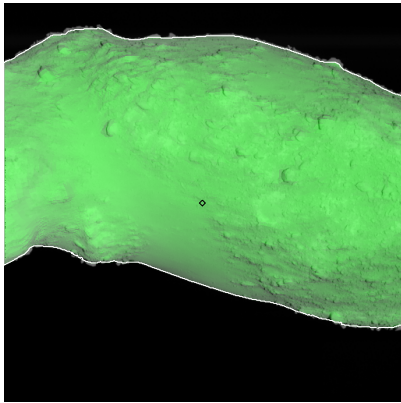


Figure 589:
ST_2495748476_v.fits

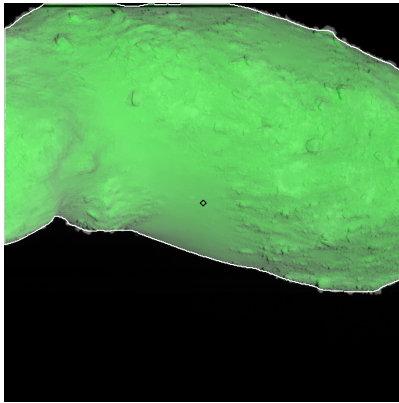


Figure 590:
ST_2495806075_v.fits

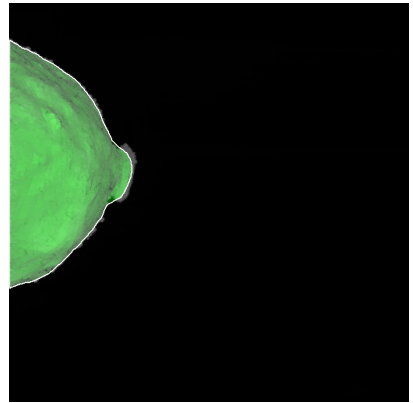


Figure 591:
ST_2496903843_v.fits

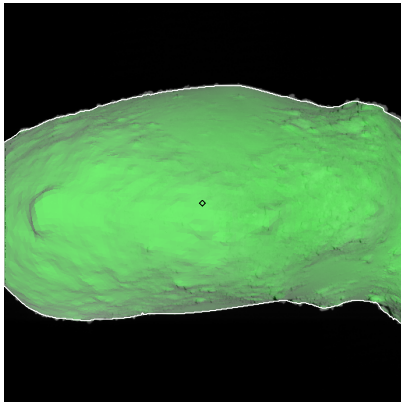


Figure 592:
ST_2497841238_v.fits

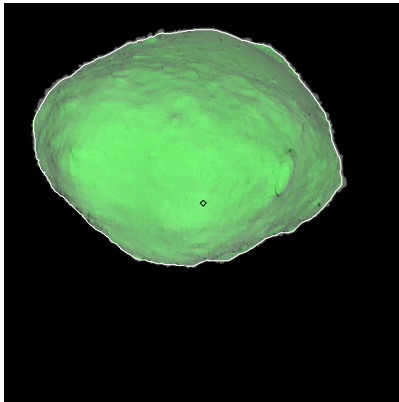


Figure 593:
ST_2498129222_v.fits

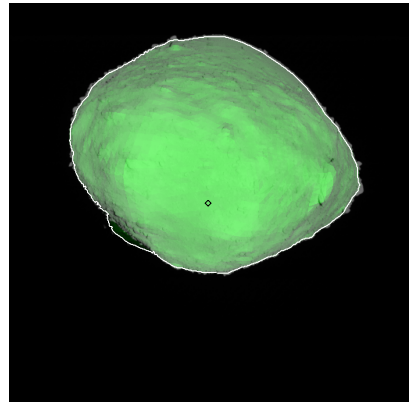


Figure 594:
ST_2498167622_v.fits

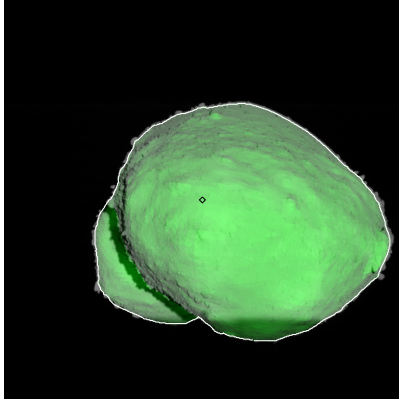


Figure 595:
ST_2498206022_v.fits

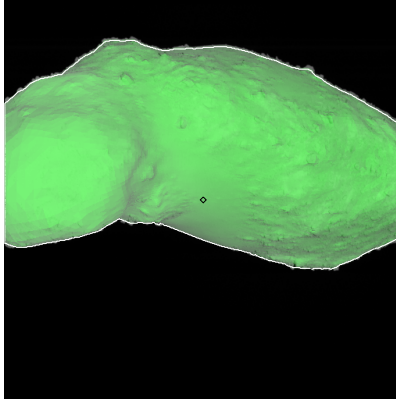


Figure 596:
ST_2498647696_v.fits

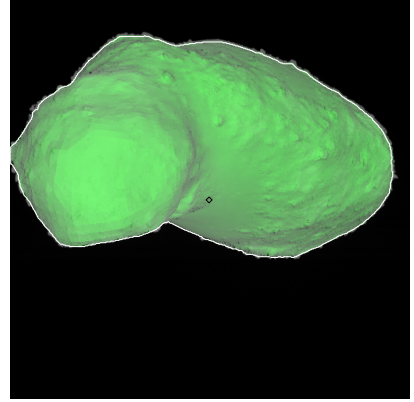


Figure 597:
ST_2498724478_v.fits

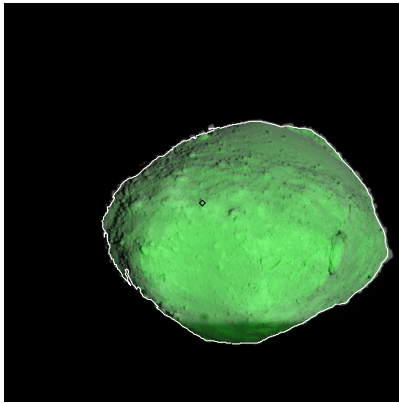


Figure 598:
ST_2506464135_v.fits

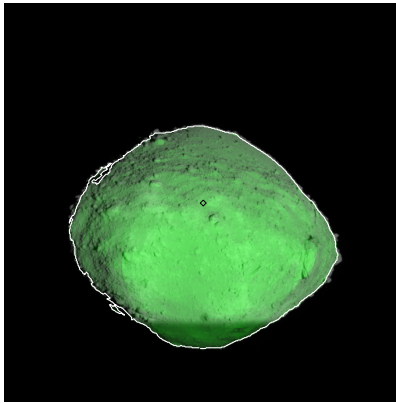


Figure 599:
ST_2506502552_v.fits

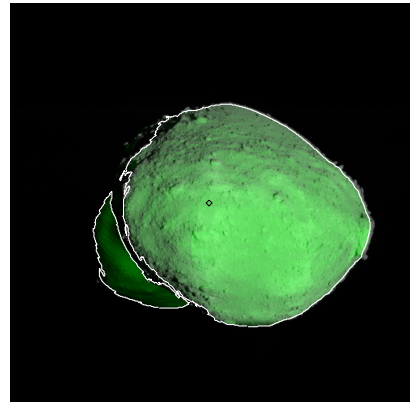


Figure 600:
ST_2506540935_v.fits

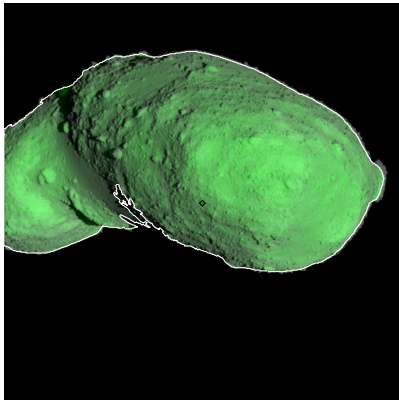


Figure 601:
ST_2506656195_v.fits

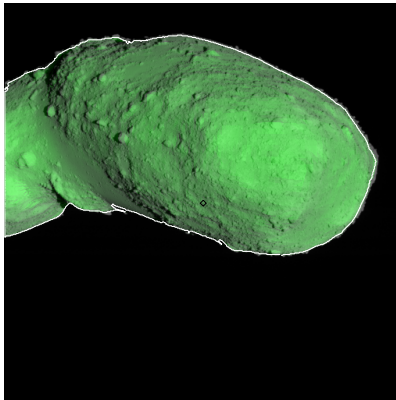


Figure 602:
ST_2506694595_v.fits

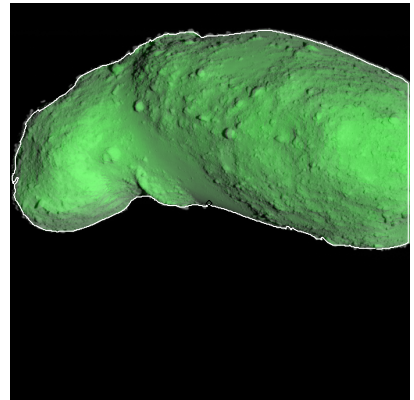


Figure 603:
ST_2506733028_v.fits

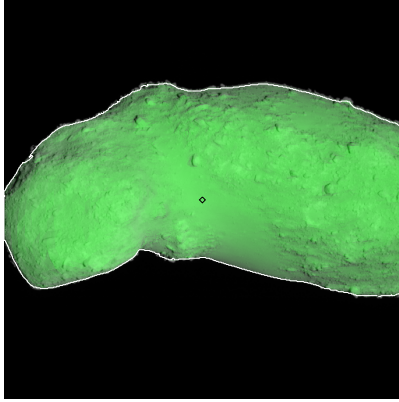


Figure 604:
ST_2506925002_v.fits

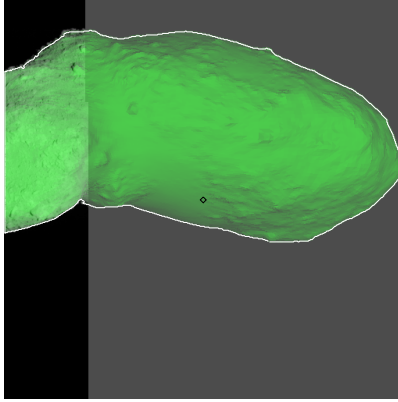


Figure 605:
ST_2506963402_v.fits

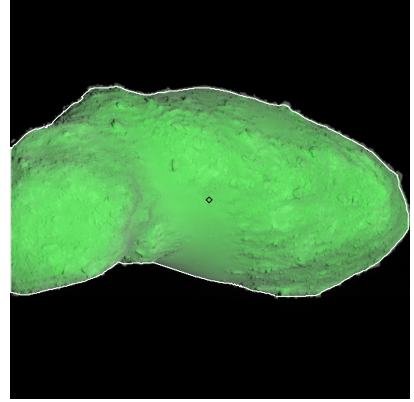


Figure 606:
ST_2507001785_v.fits

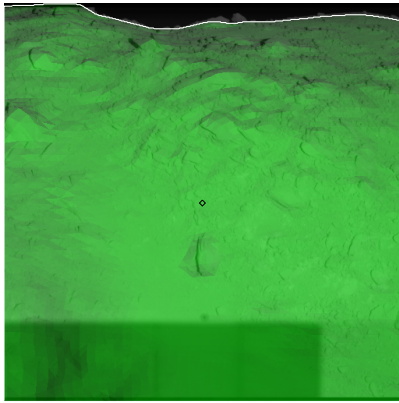


Figure 607:
ST_2530286817_v.fits

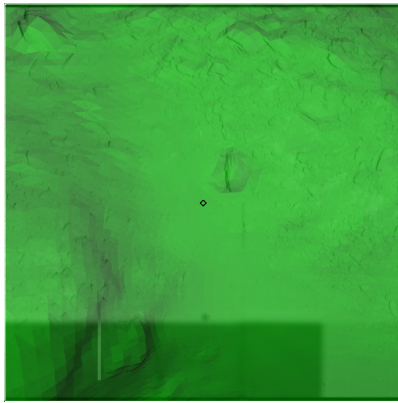


Figure 608:
ST_2530292409_v.fits

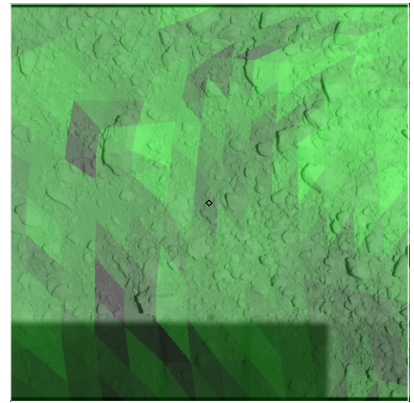


Figure 609:
ST_2530297837_v.fits

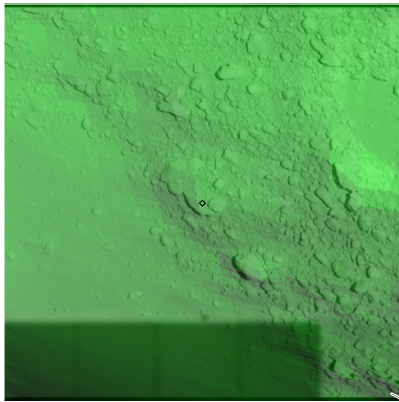


Figure 610:
ST_2532629277_v.fits

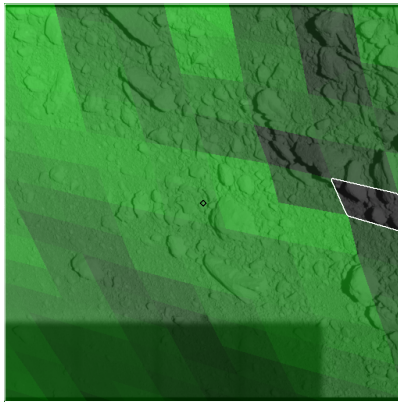


Figure 611:
ST_2539423137_v.fits

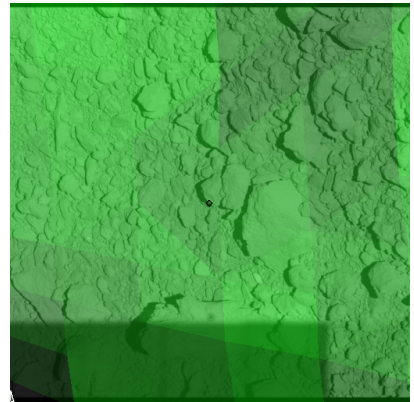


Figure 612:
ST_2539429953_v.fits

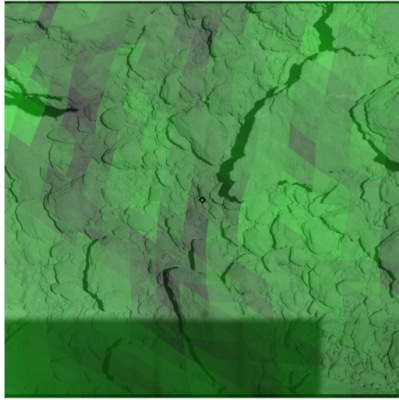


Figure 613:
ST_2539437177_v.fits

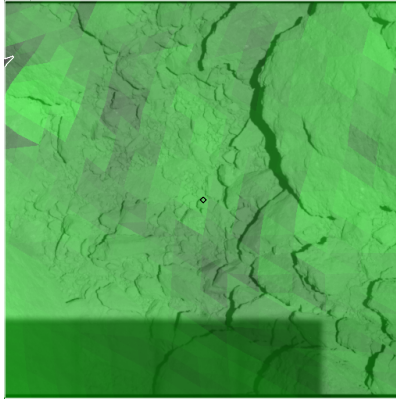


Figure 614:
ST_2539444467_v.fits

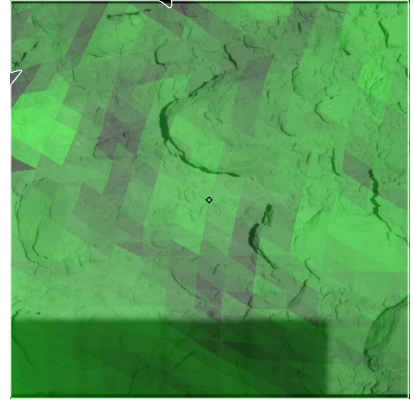


Figure 615:
ST_2539451609_v.fits

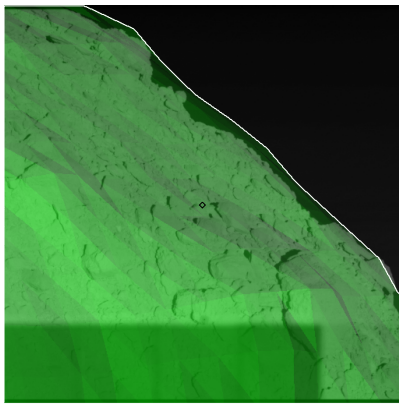


Figure 616:
ST_2539467169_v.fits

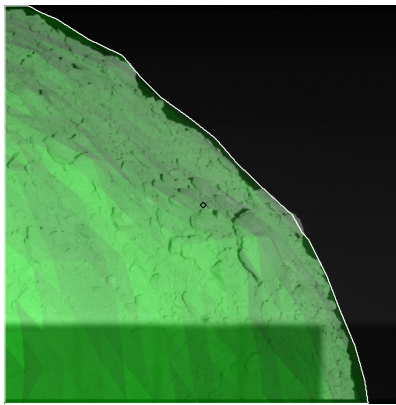


Figure 617:
ST_2539482843_v.fits

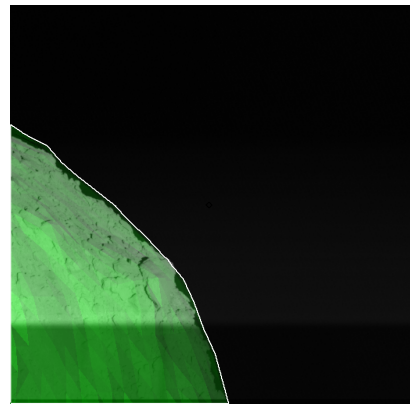


Figure 618:
ST_2539489658_v.fits

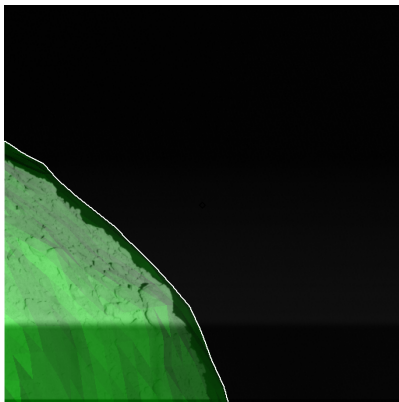


Figure 619:
ST_2539496392_v.fits

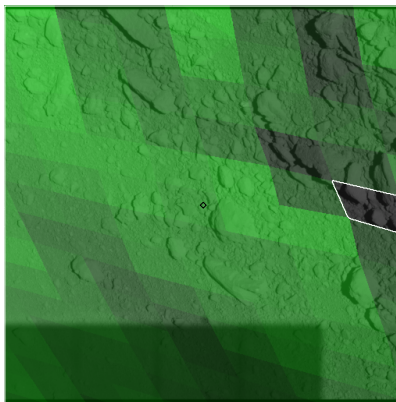


Figure 620:
ST_2539423137_v.fits

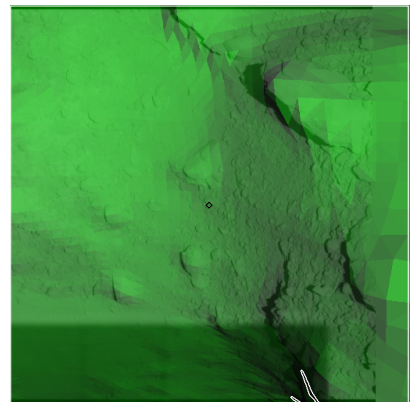


Figure 621:
ST_2559003068_v.fits