Pluto and Charon Nomenclature

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Some names in use on Pluto and Charon are now formalized and others are still informal. This appendix is meant to provide a listing of those names that are IAU-approved at this time[1], and also the informal names used in this book and by the New Horizons Team. These informal names are essentially placeholders and they may change after publication of this volume depending on work by the New Horizons team and future IAU nomenclature decisions. There are currently no feature names on the four small satellites of Pluto.

1 Pluto Nomenclature

Pluto is named after the Roman god of the Underworld, suggested by Venetia Burney in 1930. The International Astronomical Union (IAU) has assigned official names (Table 1), and the most updated list can be found at `https://planetarynames.wr.usgs.gov/Page/PLUTO/target`. The names are derived from deities and other beings associated with the underworld from mythology, folklore, and literature (faculae, maculae, and sulci); names for the underworld and underworld locales from mythology, folklore, and literature (cavi, dorsa, lacūs, and paterae); heroes and other explorers of the underworld (fluctūs, fossae, and valles); scientists and engineers associated with

[1]The original Appendix A final draft was submitted May 2021.

Pluto and the Kuiper Belt (craters and regiones); pioneering space missions and spacecraft (colles, lineae, planitiae, and terrae); and historic pioneers who crossed new horizons in the exploration of the Earth, sea, and sky (montes, paludes, and rupēs).

The informal names used in this book are also in Table 1. The formal and informal names are illustrated in Figures 2 through 7.

There are some additional "colloquial" nicknames that we include here for completeness. The "heart" on Pluto is Tombaugh Regio due to its resemblance to a heart-shape. Very soon after the flyby (and only very briefly) the large, dark feature that we informally refer to as Cthulhu was nicknamed "the whale" as its outline resembles a whale in profile. The term "brass knuckles" was used in 2015-2016 to refer to the string of the other (not Cthulhu) dark equatorial regions we informally identify as maculae that due to their regular spacing. The distinctive morphology in Tartarus Dorsa is often called the "bladed terrain" and sometimes "snakeskin" terrain. The "cellular terrain" usually refers to Sputnik Planitia, and the distinctive pits in southern Sputnik Planitia are sometimes referred to as "bacillae" due to the fact that their outlines bear a superficial resemblance to to the Bacilli taxanomic class of terrestrial bacteria. Mwindo Fossae was called "the spider" because of its shape. The bright-rimmed, dark-centered craters in Vega Terra were called "halo craters." There is some dissected terrain in Venera Terrra which was called "fretted terrain." The region northwest of Sputnik Planitia exhibits features that were called "washboard terrain." The informal Coleta de Dados Colles was also initially referred to as a "Klingon warship" as its outline resembles the long-necked vessels from the science fiction genre, Star Trek. There were no such "colloquial" names used for Charon.

Several authors have identified a north-south-ridge-trough system which constitutes negative relief sections in some places (e.g. the trough west of Al-Idrisi) and positive relief sections in others (e.g. Pigafetta and Elcano Montes) but which are otherwise aligned along a rough north-south great circle. Although it is not a single "feature" and therefore has no formal IAU name, it is referred to as Pluto's Ridge Trough System (RTS) by the New Horizons Team. This feature was also informally called "Paul's Valley" (despite that it wasn't just a single valley) in reference to two connections in the New Horizons Team: Jeff Moore's birthplace was in Paul's Valley, Oklahoma, and Paul Schenk initially investigated this structure.

Name	Central Latitude (°)	Central Longitude (°E)	Area (km^2)	Length (km)
Cavi				
Adlivun Cavus	-15.4	188.9	177	21
Baralku Cavi (Xibalba)	7.7	198.1	287	15
Hekla Cavus	6.9	154.7	4622	82
Colles				
Astrid Colles	12.4	186.0	240	27
Challenger Colles	23.0	195.0	2368	69
Coleta de Dados Colles	22.4	163.9	346	42
Columbia Colles	28.6	196.4	1168	52
Soyuz Colles	17.6	183.2	126	15
Craters				
Brinton	3.7	150.7	1045	40
Burney	45.7	133.8	58,247	297
Coughlin	15.2	150.5	1387	46
Coradini	42.9	191.5	976	37
Drake	45.3	233.2	3753	76
Edgeworth (*K. Edgeworth*)	6.7	109.4	18,367	163
Elliot	12.0	138.9	6516	96
Farinella	50.8	179.3	334	24
Giclas	39.5	201.7	1910	53
Guest	61.0	277.5	9861	128
H. Smith	4.7	157.8	1099	40
Hardaway	46.9	140.9	90	11
Hardie	23.8	141.6	307	21
Harrington	-0.8	152.4	3907	76
Hollis	46.3	240.1	993	39
Isakowitz	36.7	106.6	522	26
Khare	27.9	94.6	2185	58
Kiladze (*Pulfrich*)	28.4	212.9	1587	50
Kowal	49.2	217.7	3675	79
Oort	7.9	92.1	13,380	138
Owen	0.2	162.4	270	20
Pulfrich (*Khare*)	77.8	136	1218	49
Safronov	49.2	204.6	2266	58
Simonelli	12.8	314.8	57,110	288
Zagar	-5.7	155.3	5875	93
Dorsa				
Pandemonium Dorsa	-26.4	186.0	67,979	590
Tartarus Dorsa	8.5	233.1	309,727	851
Faculae				
Supay Facula	26.7	213.9	20,899	197

Name	Central Latitude (°)	Central Longitude (°E)	Area (km^2)	Length (km)
Fluctūs				
Dionysus Fluctus	26.5	199.1	2023	73
Mpobe Fluctus	10.4	198.5	2063	113
Pere Porter Fluctus	0.2	195.7	9463	164
Xanthias Fluctus	21.4	199.3	3113	103
Fossae				
Beatrice Fossa	-0.6	128.4	4001	367
Djanggawul Fossae	41	84.3	25,724	587
Dumuzi Fossa	31.2	129.6	7559	441
Hermod Fossae (*Uncama*)	-8.6	119.3	17,288	364
Inanna Fossa	32.1	127.5	9540	551
Kaknú Fossa	-30.5	122.0	5139	294
Mwindo Fossae	34.7	245.8	18,892	406
Sleipnir Fossa	23.7	234.5	12,158	509
Sun Wukong Fossa	-1.1	230.1	11567	329
Uncama Fossa	23.5	143.9	3220	225
Virgil Fossae	5.2	122.8	19,667	710
Lacūs				
Alcyonia Lacus	36.4	152.0	318	30
Lineae				
Chandrayaan Linea	16.9	351.4	26,831	368
Luna Linea	13.9	15.1	88,309	754
Yutu Linea	33.0	360.0	34,846	515
Macula				
Ala Macula	-12.6	238.9	50,187	354
Balrog Macula	-7.5	281.5	528,429	1281
Cadejo Macula	59.2	135.5	3157	106
Cthulhu Macula	-7.9	95.7	1,620,675	3241
Krun Macula	-12.7	210.1	192,641	737
Hun-Came Macula	-8.0	343.8	173,066	614
Meng-p'o Macula	-8.0	360.0	69,446	402
Morgoth Macula	-19.1	172.2	745	36
Vucub-Came Macula	-8.4	319.0	164,481	551
Montes				
Al-Idrisi Montes	34.0	156.0	37,984	383
Baret Montes (*Baré*)	14.6	157.8	19,518	223
Elcano Montes (*York*)	-26.04	143.7	55,416	489
Hillary Montes	3.3	169.6	27,279	388
Piccard Mons	-35.3	176.8	38,376	256
Pigafetta Montes (*Enrique*)	-6.8	146.4	12,443	234
Tabei Montes	-11.7	164.3	4050	104
Tenzing Montes (*Norgay*)	-15.6	177.4	25,670	283

Name	Central Latitude (°)	Central Longitude (°E)	Area (km^2)	Length (km)
Wright Mons	-21.4	173.2	16,890	165
Zheng He Montes	19.1	160.2	4226	104
Paludes				
Tinné Paludes	-1.4	201.6	17,699	182
David-Néel Palus	13.2	207.4	1951	97
Hyecho Palus	-22.4	165.4	41,893	365
Planitiae				
Ranger Planitia (*Bird Planitia*)	25.5	125.5	134,065	565
Lunokhod Planitia (*Piri Planitia*)	32.8	109.6	117,480	626
Sputnik Planitia	19.5	178.7	672,454	1495
Regiones				
Lowell Regio	86.0	338.0	992,001	1208
Tombaugh Regio	7.6	183.2	1,408,275	2301
Rupēs				
Cousteau Rupes	40.7	191.5	16,008	530
Eriksson Rupes	59.9	234.8	2778	381
Piri Rupes	27.1	108.9	27,635	549
Terrae				
Hayabusa Terra	46.1	229.9	430,716	1114
Pioneer Terra	62.6	192.1	97,339	434
Vega Terra	34.0	85.5	589,239	1614
Venera Terra	56.9	117.6	183,093	746
Viking Terra	11.8	148.2	379,169	1354
Voyager Terra	60.1	153.5	261,000	844
Valles				
Heyerdahl Vallis	41.5	148.9	6831	180
Hunahpu Vallis (*Kupe*)	49.1	154.4	13,423	298
Ivanov Vallis	82.4	128.2	1041	118

Table 1: Pluto nomenclature. Names in bold font are those accepted by the IAU. Names in parentheses were names that a feature may have been informally referred to prior to an official IAU name. Names in italics are informal names. Cthulhu has also been referred to as a regio, or without a descriptor. The Length column above refers to the "longest dimension" of the feature, and will be the distance between the two farthest points (e.g. for craters it will be the largest diameter).

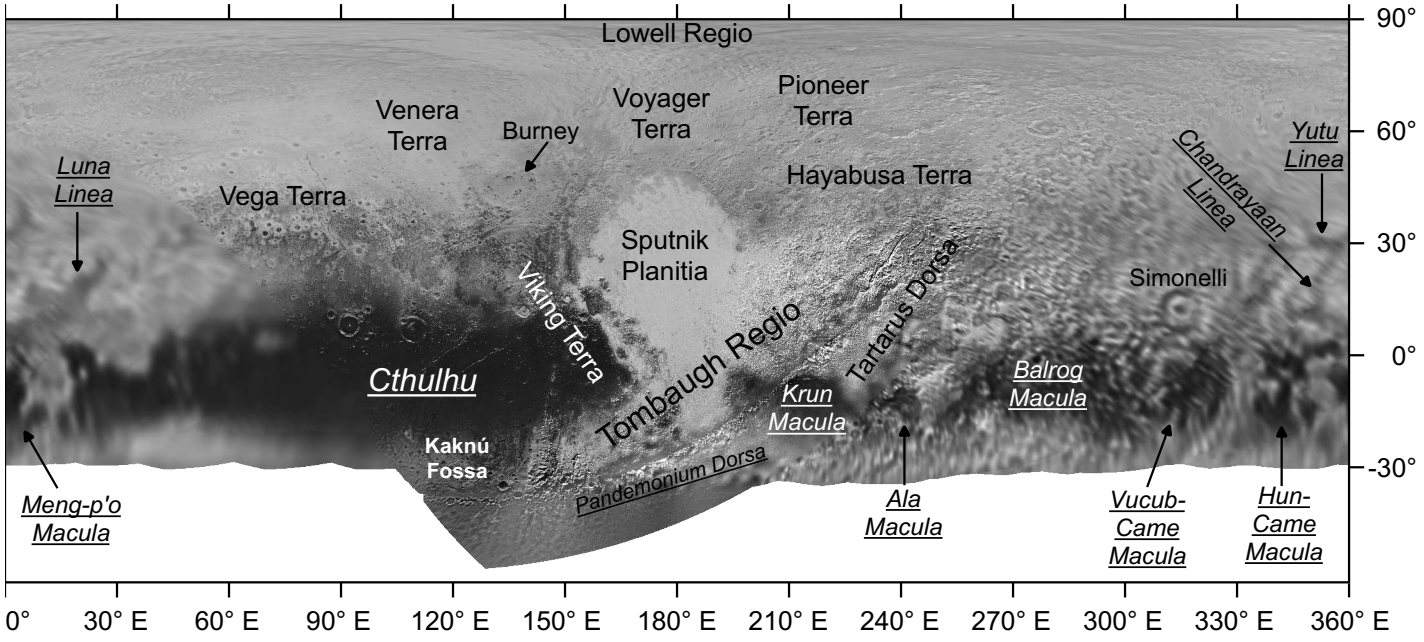

Figure 1: Pluto mosaic. IAU-accepted names are in regular font. Underlined names in italics are informal names.

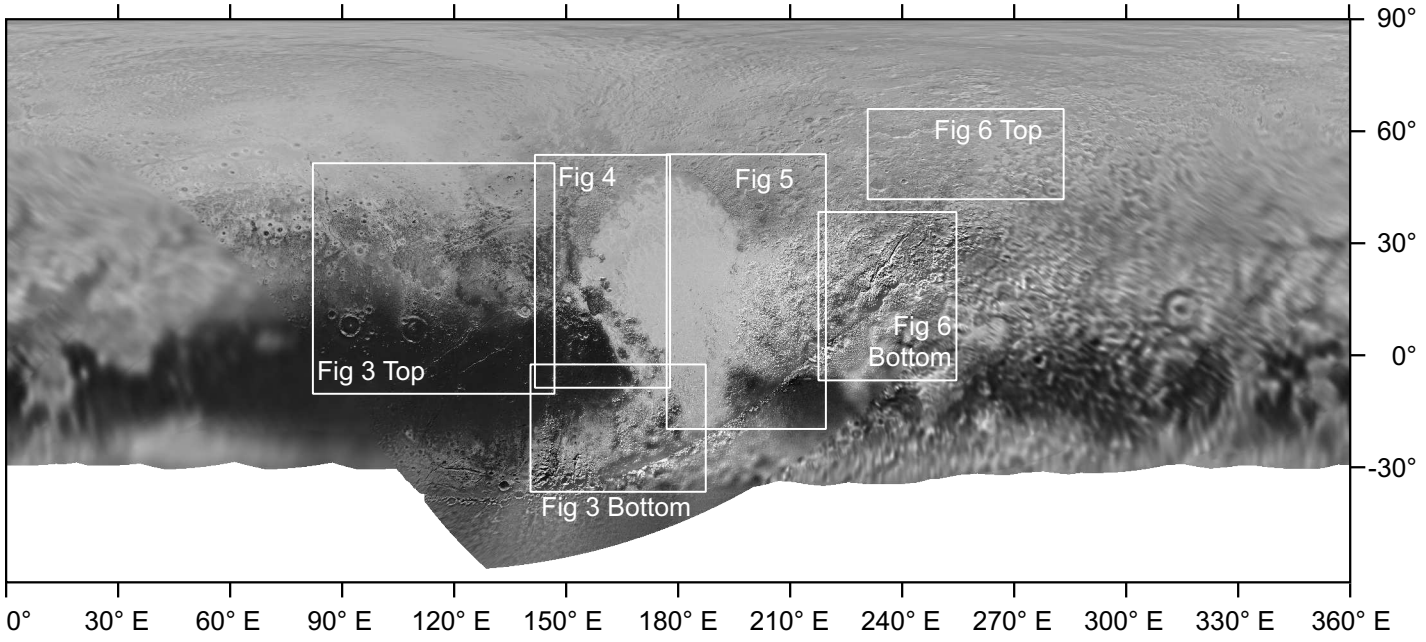

Figure 2: Pluto mosaic with locations of Figures 3 through 6.

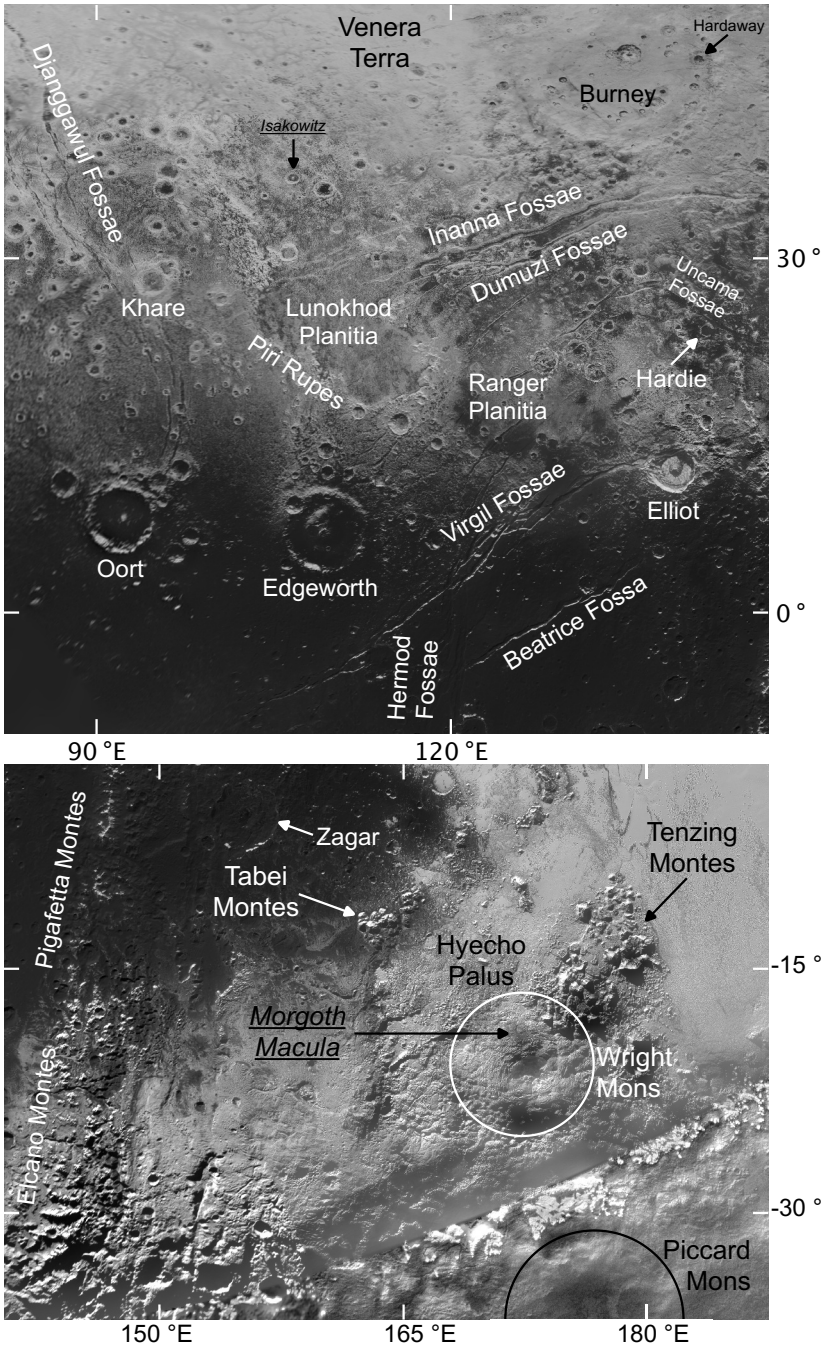

Figure 3: Top: Western area of Pluto's encounter hemisphere. Bottom: Southwest of Sputnik on Pluto. IAU-accepted names are in regular font, and italicized underlined names are informal names.

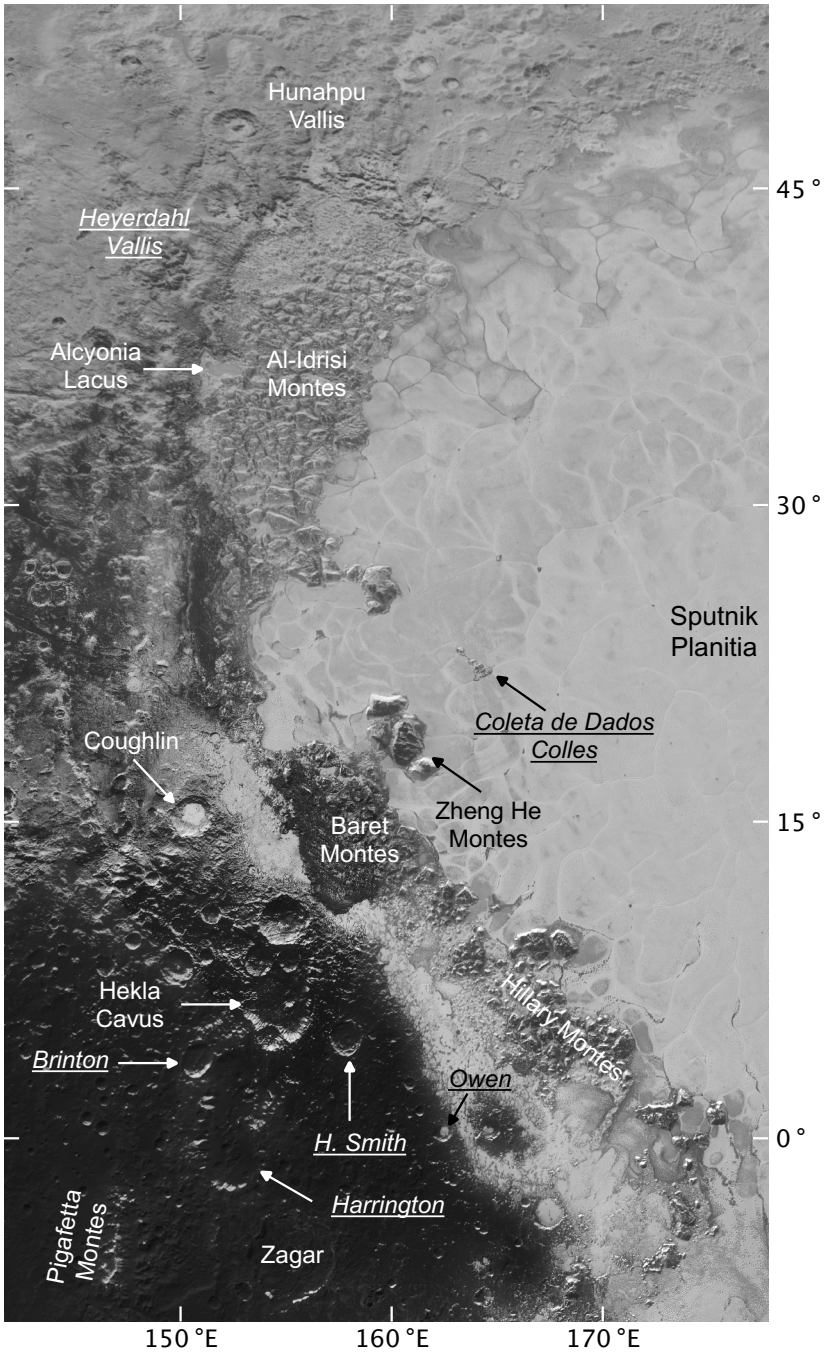

Figure 4: Western half of Sputnik Planitia on Pluto. IAU-accepted names are in regular font, and italicized underlined names are informal names.

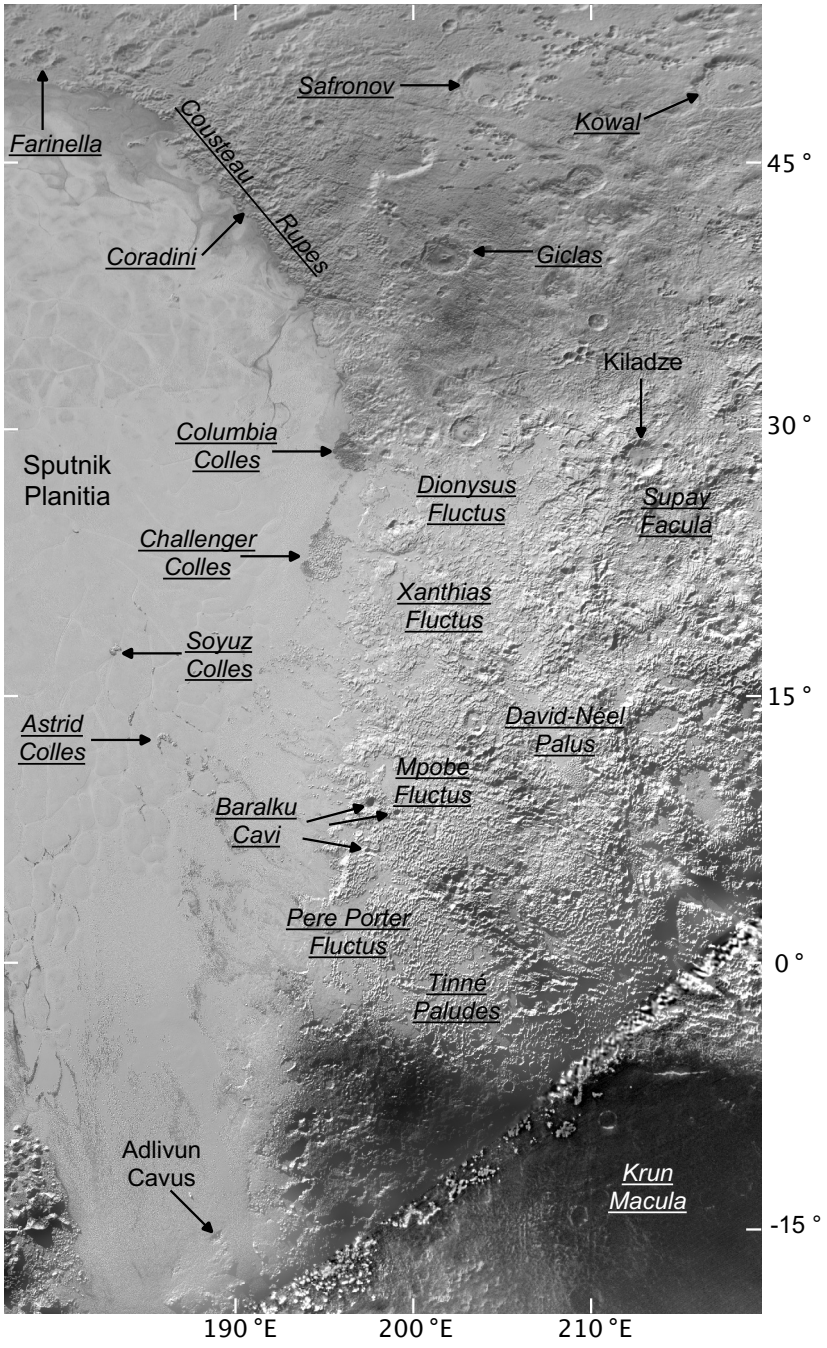

Figure 5: Eastern half of Sputnik Planitia on Pluto. IAU-accepted names are in regular font, and italicized underlined names are informal names.

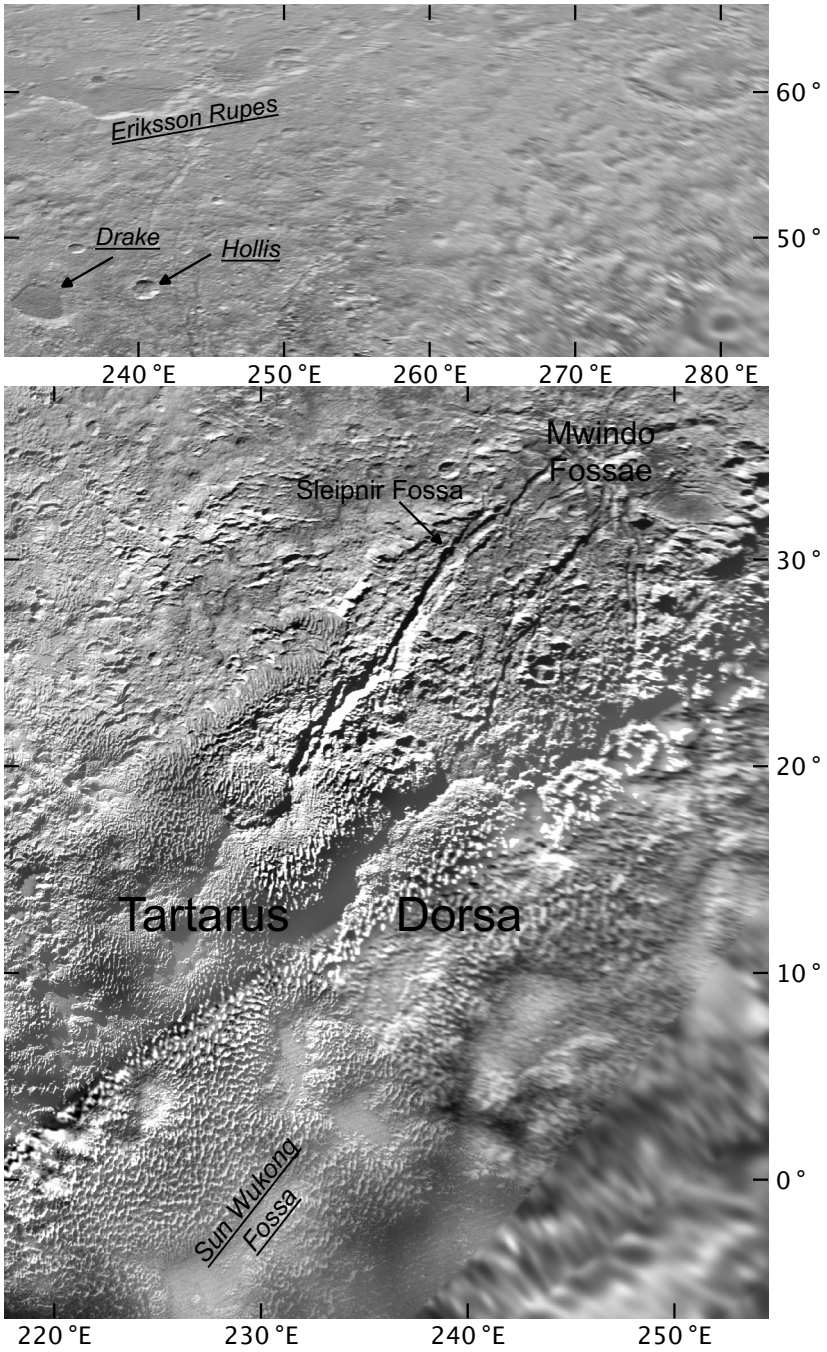

Figure 6: Top: Northeast of Sputnik Planitia on Pluto. Bottom: Tartarus Dorsa area on Pluto. IAU-accepted names are in regular font, and italicized underlined names are informal names.

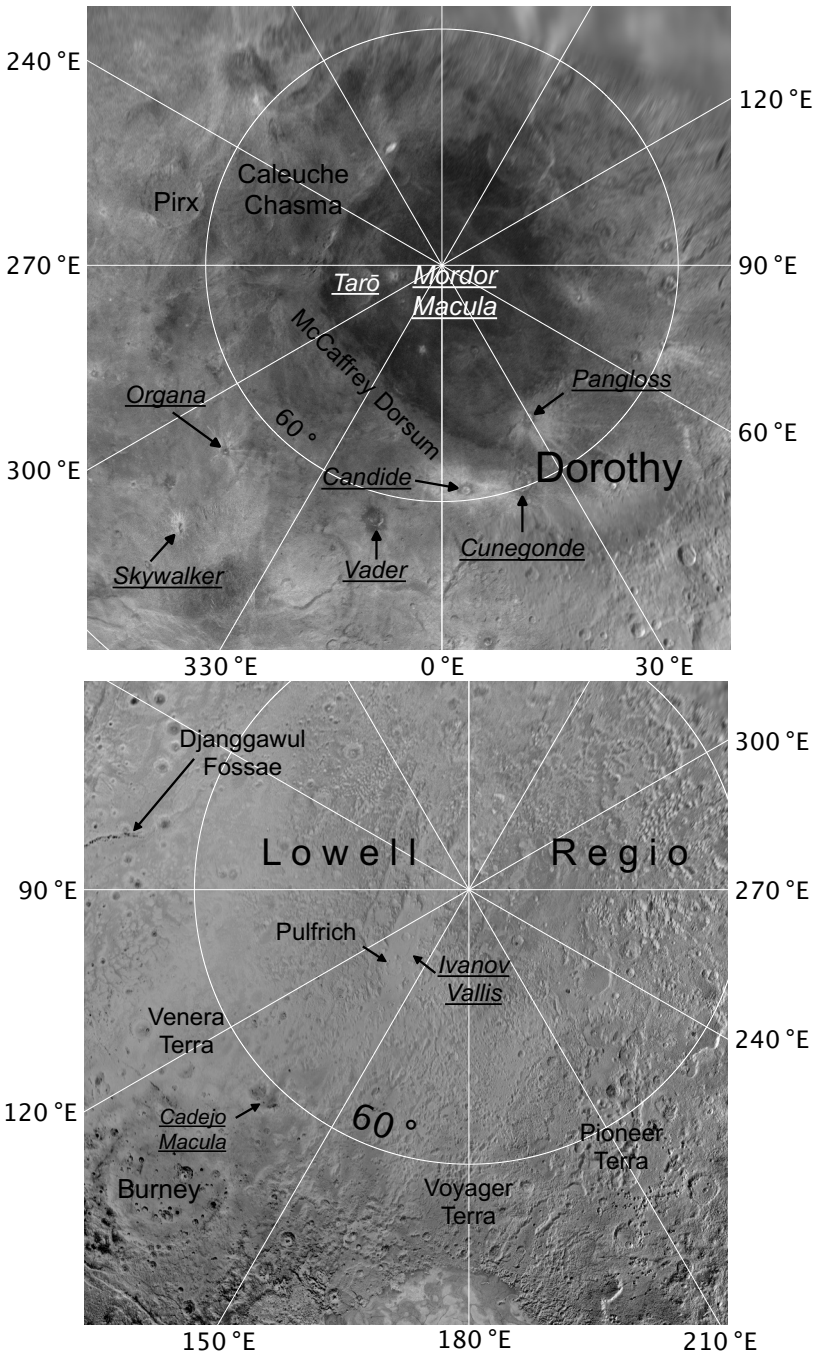

Figure 7: Pluto (bottom) and Charon (top) in north polar stereographic projection. IAU-accepted names are in regular font, and italicized underlined names are informal.

2 Charon Nomenclature

Charon is named after the mythological Greek boatman who ferried souls across the river Styx to Hades for judgement. The name, "Charon," was suggested by James Christie, who discovered Charon in 1978. Dr. Christie's wife, Charlene, has the nickname "Char," which was a motivation for the suggestion, and also the reason why many pronounce the name of the satellite with the French "ch" pronunciation as it is in "Charlene." Without knowing this background, it would be pronounced with the "ch" pronunciation of words with a Greek origin, like "chaos," that might be more expected for a greek name like "Charon."

The names in Table 2 include the names that have been accepted by the IAU and informal names used in this book. The ongoing updated list can be found at `https://planetarynames.wr.usgs.gov/Page/CHARON/target`. The names are derived from destinations and milestones of fictional space and other exploration (maculae, plana, planitiae, and terrae); fictional and mythological vessels of space and other exploration (chasmata); fictional and mythological voyagers, travelers, and explorers (craters); and authors and artists associated with space exploration, especially Pluto and the Kuiper Belt (montes).

These names are illustrated in Figures 7 through 11.

Name	Central Latitude (°)	Central Longitude (°E)	Area (km^2)	Length (km)
Chasmata				
Argo Chasma	27.8	80.4	12,685	330
Caleuche Chasma	72.5	241.8	45,639	445
Macross Chasma	11.4	337.0	751	58
Mandjet Chasma	4.8	294.4	16,970	387
Nostromo Chasma	44.1	336.7	1440	99
Serenity Chasma	20.7	11.7	17,399	410
Tardis Chasma	19.6	318.9	3613	233
Craters				
Ahab	36.4	279.5	179	18
Alice	21.7	345.4	3048	66
Arroway	4.7	107.0	6571	101
Beowolf	34.9	21.0	510	28
Candide	61.3	6.2	167	16
Cora	17.1	351.7	58	9
Cunegonde	60.7	20.5	790	35
Dinga	-8.7	338.2	426	26
Dorothy	58.5	40.6	47,139	271
Fierro	34.1	11.8	584	30
Finn	41.3	301.1	896	37

Name	Central Latitude (°)	Central Longitude (°E)	Area (km^2)	Length (km)
Guildenstern	28.9	21.2	305	22
Jim	45.0	299.4	506	28
Kaguya-Hime	-11.9	28.1	1424	46
Kersain	-14.3	342.6	727	34
Kirk	-4.7	1.9	1008	38
Kukudmi	26.3	36.4	2374	59
Lāčplēsis	16.8	324.6	844	36
Madoc	39.7	288.2	144	15
Nasreddin	25.6	308.6	559	30
Nemo	-15.7	314.1	1490	47
Organa	54.3	310.7	96	15
Pangloss	67.6	29.9	159	16
Panza	43.5	40.3	570	32
Pirx	55.2	256.3	5235	91
Revati	20.8	35.4	1091	40
Ripley	42.0	327.9	3080	70
Rosencrantz	26.7	20.3	871	36
Sadko	-16.1	331.2	658	32
Skywalker	44.5	315.0	95	13
Spock	14.5	25.8	1023	38
Sulu	-7.9	24.8	508	28
Sundiata	-2.4	345.6	4455	80
Tarō	78.7	284.2	2887	74
Tichy	7.0	38.1	893	38
Tintin	11.0	277.4	918	38
Uhura	-19.3	4.2	789	35
Utnapishtim	-10.7	342.2	747	33
Vader	57.1	345.5	386	25
Dorsa				
McCaffrey Dorsum	79.0	306.81	12,376	424
Maculae				
Gallifrey Macula	25.0	334.2	16,379	179
Mordor Macula	81.3	358.4	117,530	395
Montes				
Butler Mons	-9.5	38.7	4899	91
Kubrick Mons	3.6	30.8	777	40
Clarke Montes	-5.1	7.1	1684	75
Planitiae				
Vulcan Planitia	-4.2	357.0	396,621	1616

Name	Central Latitude (°)	Central Longitude (°E)	Area (km^2)	Length (km)
Terrae				
Oz Terra	44.3	325.8	720,084	1561
Valles				
Matahourua Vallis	39.6	318.7	5220	116

Table 2: Charon nomenclature. Names in bold font are those accepted by the IAU. Names in italics are informal names.The Length column above refers to the "longest dimension" of the feature, and will be the distance between the two farthest points (e.g. for craters it will be the largest diameter).

3 Descriptors

These are the descriptor terms used on Pluto and Charon, as defined by the IAU.

Cavus, cavi A hollow or irregular steep-sided depression. They usually occur in arrays or clusters.

Chasma, chasmata A deep, elongated, steep-sided depression.

Collis, colles A small hill or knob.

Crater, craters A circular depression.

Dorsum, dorsa A ridge.

Facula, faculae A Bright spot.

Fluctus, fluctūs Flow terrain.

Fossa, fossae A long, narrow depression.

Lacus, lacūs A small plain.

Linea, lineae A dark or bright elongate marking, may be curved or straight.

Macula, maculae A dark, possibly irregular, spot.

Mons, montes A mountain.

Palus, paludes From "swamp" but used for small interconnected plains.

Planitia, planitiae A low plain.

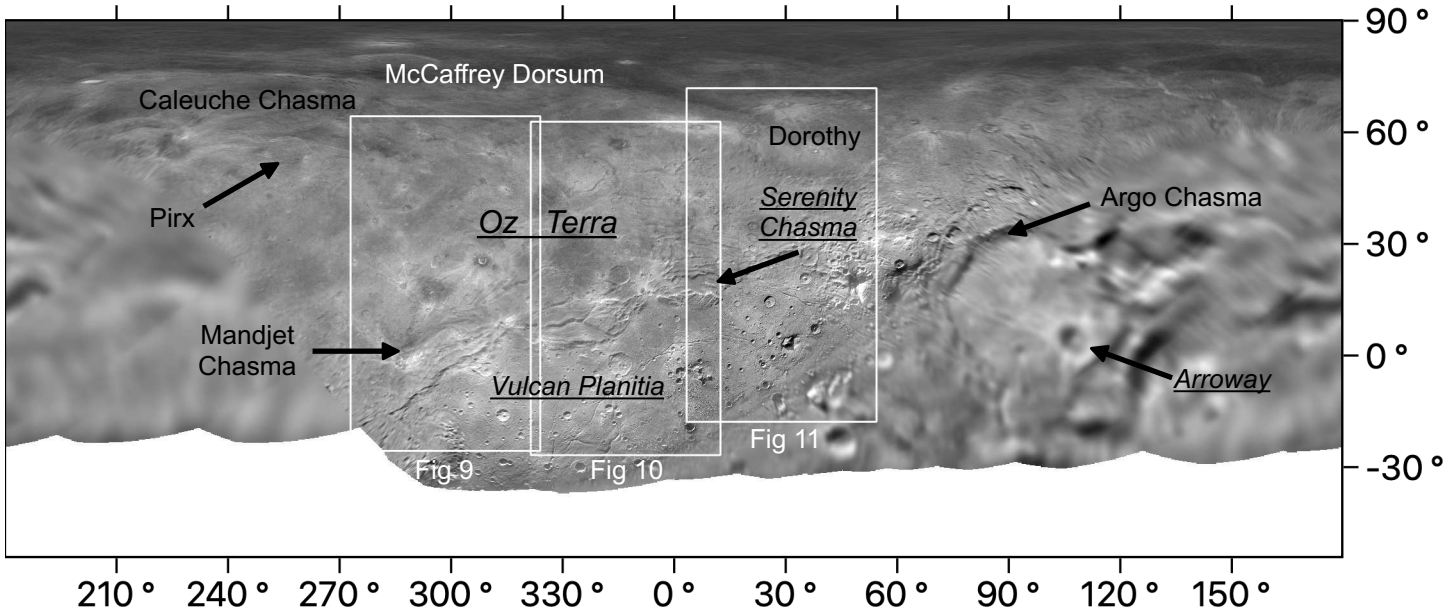

Figure 8: Charon mosaic. IAU-accepted names are in regular font, and italicized underlined names are informal names.

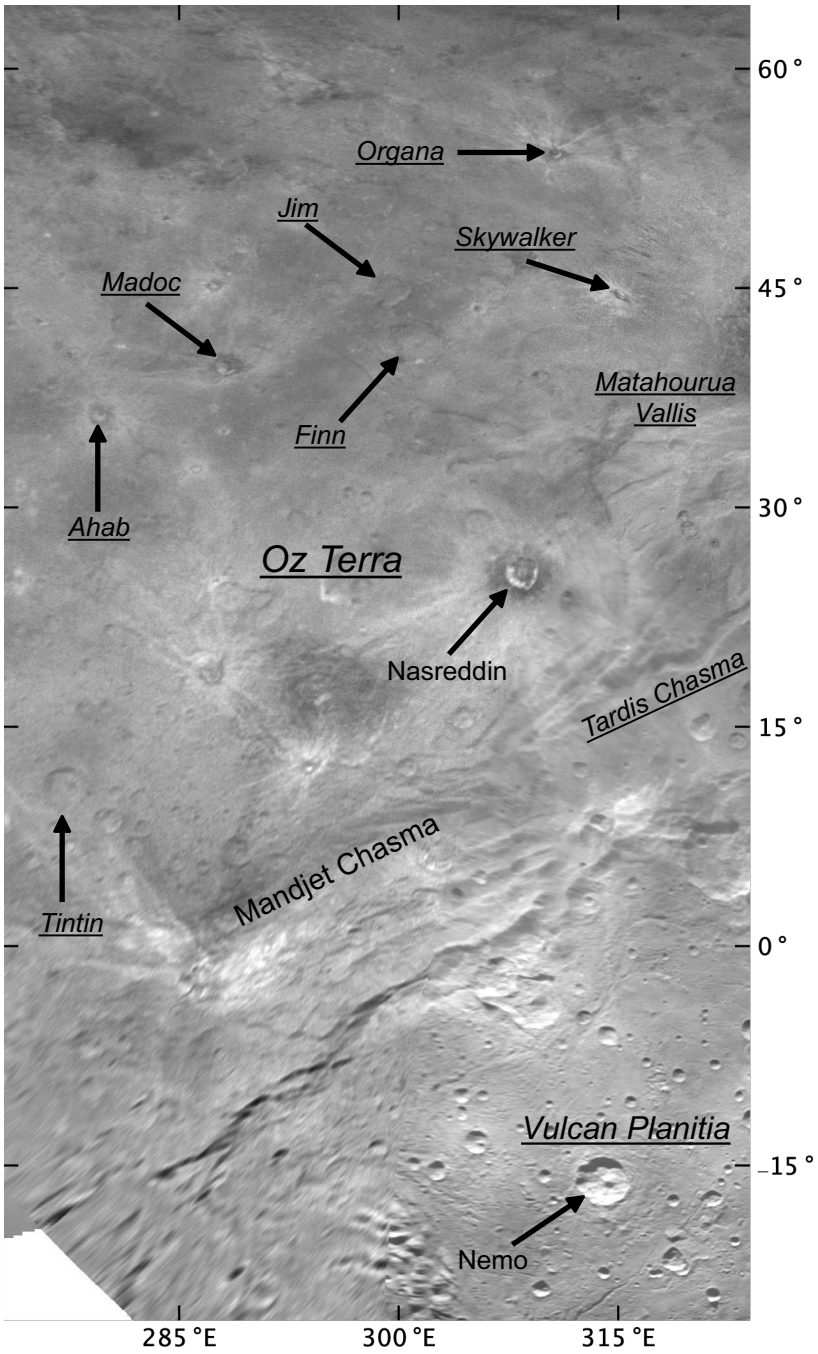

Figure 9: Western region of Charon encounter hemisphere. IAU-accepted names are in regular font, and italicized underlined names are informal names.

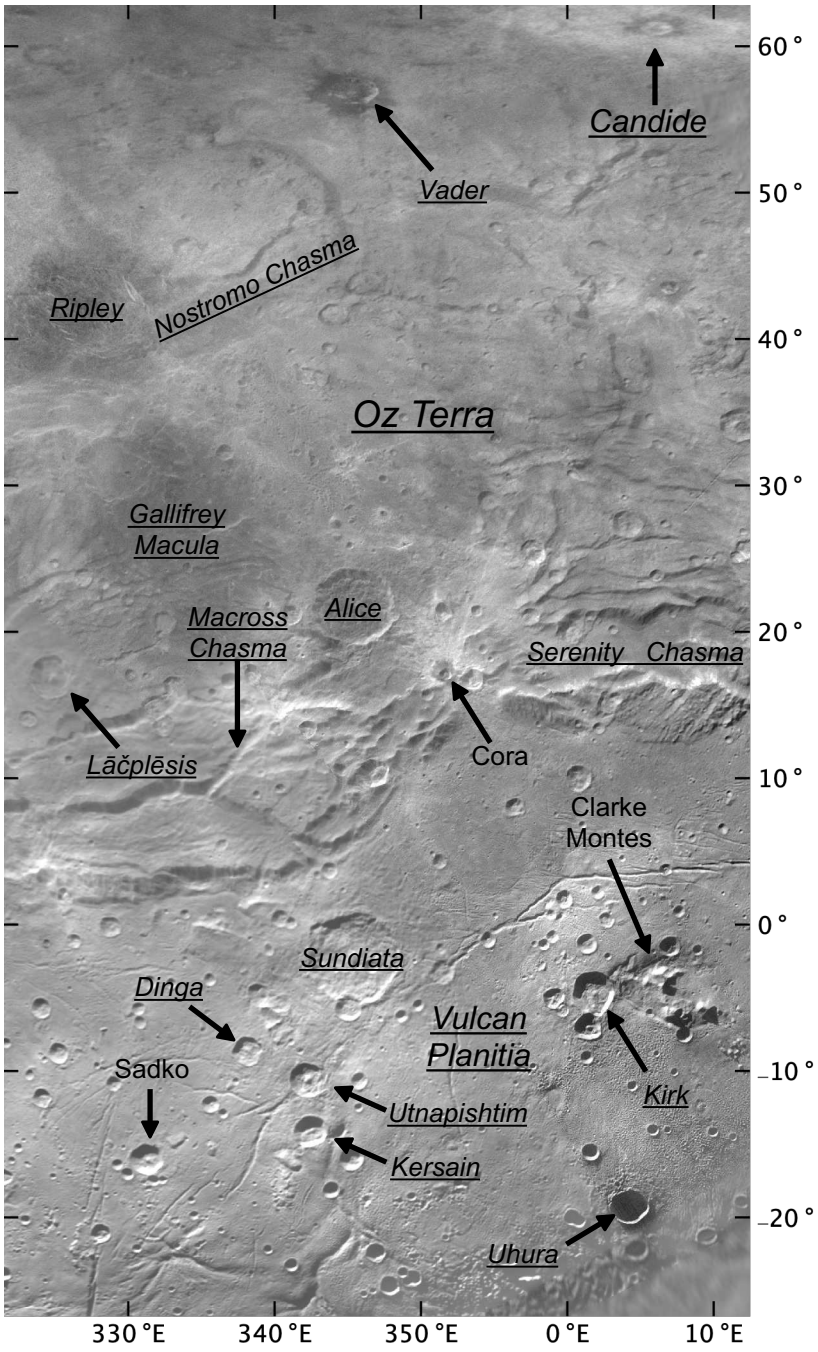

Figure 10: Central region of Charon encounter hemisphere. IAU-accepted names are in regular font, and italicized underlined names are informal names.

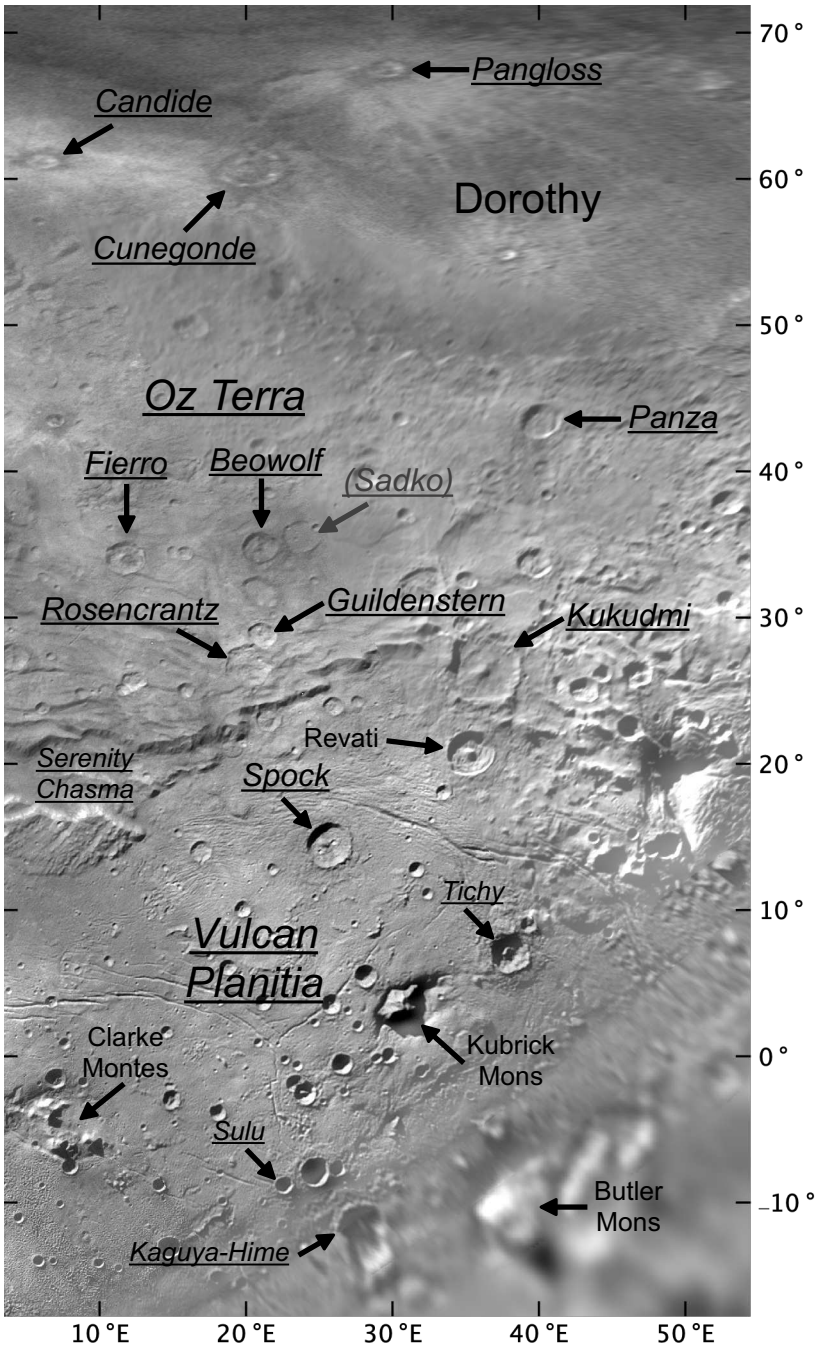

Figure 11: Eastern region of Charon encounter hemisphere. IAU-accepted names are in regular font, and italicized underlined names are informal names. The crater indicated as "(Sadko)" was referred to as Sadko by the New Horizons team before that name was officially given to the crater in Figure 10.

Regio, regiones A large area marked by reflectivity or color distinctions from adjacent areas, or a broad geographic region.

Rupes, rupēs A scarp.

Terra, terrae An extensive land mass.

Vallis, valles A valley.

4 Acknowledgement

The authors thank Stuart Robbins for reviewing the contents of this appendix.

Appendix: Differences from the Version Published in *The Pluto System after New Horizons*

As noted on the first page, this work was originally published in *The Pluto System after New Horizons* book. The differences between the appendix published there and this document are essentially those of formatting. The text, figures, and tables contain the same content and this section has been added.

Please use the citation on the first page to reference this work.