

Index

A

- Absorptivity, 642, 682
- Abundance(s), 339, 388, 389, 408, 410, 484, 485, 491, 509, 541, 560, 561, 616, 619, 621, 648, 654, 658–661, 665, 667, 668, 670, 673, 676, 780
- Acetonitrile (CH₃CN), 561, 619
- Acetylene (C₂H₂), 559, 560, 562
- Adams, J.C., 492, 493, 582
- Adams-Williamson equation, 494
- Adiabatic
- convection, 344, 345
 - lapse rate, 348, 368, 369, 375, 385
 - pressure-density relation, 344
 - processes, 345
- Adoration of Magi, 610, 612
- Adrastea (satellite, Jupiter XV), 524, 529, 572
- Airy, G.B., 492
- Albedo
- bolometric, 338, 477, 636, 642, 687, 780
 - bond, 477, 516, 627, 747, 772, 780
 - geometric (visual), 477, 564, 581
- Alfvén waves, 460
- Aluminum isotopes, 694
- Alvarez, L., 668
- Amalthea (satellite, Jupiter V), 355, 529, 537, 572
- Ambipolar diffusion, 402, 703
- American Meteor Society, 637, 638
- Amidogen radical (NH₂),
- Ammonia (NH₃), 348, 391, 480, 481, 483, 485, 512, 558, 560, 619, 625, 627, 756
- Ammonium hydrosulfide (NH₄SH), 481, 483
- Anaxagoras of Clazomenae, 598
- Angular
- diameter(s), 493, 686
 - momentum, 354, 383–385, 443–445, 475, 479, 510, 589, 607, 681, 701, 778
 - resolution, 686
 - velocity/velocities, 349, 350, 354, 570, 605
- Apollonius of Myndus, 598
- Aquinas, T., 598
- Archaeomagnetic data, 423
- Ariel (satellite, Uranus I), 523, 527, 532, 533, 564
- albedo, 564
- Aristotle, 598, 599
- Artemis, 648
- Asteroid(s) (general)
- albedo(s), 683, 686–688, 696, 700
 - densities, 639, 689–690
 - dimension(s), 686–690
 - double, 689
 - inner solar system plot, 678, 681, 690
 - masses, 686–690
 - nomenclature, 648–649, 677–681
 - orbital properties
 - families, 681–685
 - Kirkwood gaps, 582, 678, 695, 697 - outer solar system plot, 588–590, 603
 - radii, 688
 - rotations, 688, 700
 - thermal emissions, 697
- Asteroid mill, 639, 676, 769
- Asteroids (individual)
- (2101) Adonis, 683
 - (1221) Amor, 681, 690
 - (3554) Amun, 683
 - (1943) Anteros, 681
 - (2061) Anza, 681
 - (1862) Apollo, 683, 684, 698
 - (197) Ariete, 689
 - (2062) Aten, 683

Asteroids (individual) (*cont.*)

- (1865) Cerberus, 683
- (1) Ceres, 676–677, 689
- (2060) Chiron, 627, 684
- (1864) Daedalus, 683
- (136199) Eris, 528, 690
- (433) Eros, 681, 683, 690, 691, 698
- (951) Gaspra, 689
- (2340) Hathor, 683
- (624) Hektor (Hector), 689
- (2212) Hephaistos, 683
- (944) Hidalgo, 627, 684, 699
- (1566) Icarus, 683
- (243) Ida, 689
- (3) Juno, 690, 691
- (2) Pallas, 677, 678, 687, 689–691, 698
- 1989 PB,
- (3200) Phaethon, 631, 683
- (5145) Pholus, 627, 685
- (1915) Quetzalcoatl, 681
- (5381) Sekhmet, 681
- (2608) Seneca, 681
- 2004 VB61, 681
- (4) Vesta, 653, 689–696
- 2004 WC1, 683
- 2004 WS2, 683

Asteroids (types)

- Amor(s), 681, 690
- Apollo(s), 683, 684, 698
- Aten(s), 683
- Centaur(s), 589, 609, 627, 680
- Cubewano(s), 681
- excited/hot objects, 685
- Flora family, 681, 682
- Hilda family, 679, 681, 684, 698
- Koronis family, 681, 682, 689
- Kuiper Belt objects (KBOs)
 - classical/cold, 685
 - excited/hot, 685
- main belt, 642, 678, 679, 681, 690, 693, 697, 759
- Plutino(s), 568, 589, 680, 681, 685, 759
- scattered population, 626, 628, 685, 779
- trans-Neptunian object(s) (TNOs), 568, 589, 685, 690, 759
 - eccentricities vs. semi-major axes, 685
- Trojan(s) & Greek(s), 548, 677, 679, 681, 684, 690, 699

Astronomical unit (au), 339, 601, 609, 769

Atlas (satellite, Saturn XV), 526, 530, 576

Atmosphere/atmospheric

- air mass(es), 364, 365
- circulation(s)

- eddy/eddies, 363–365, 384
- Ferrel cell(s), 362–363, 378, 385
- global, 360–367
- Hadley cell(s), 361–362, 378–380, 384, 480, 555, 558
- meridional, 363–366, 378–381, 384, 555, 556
- parasitic cell(s), 363
- polar cell(s), 362–363
- thermal, 357–358, 362
- wave motion(s), 365
- zonal, 365, 366, 380–385, 555
- constituent(s), 337–340, 371, 372, 479, 560, 764, 773
 - comparative, 387
- convection, 344, 345, 369, 388, 483
- diffusion, 386–389, 484, 496
- diffusion time, 388, 496
- diffusive equilibrium, 388
- Earth
 - average lapse rate, 368
 - circulation, 357, 361, 377, 378, 555
 - composition, 387, 781
 - cyclones, 383, 384
 - diffusion time, 388
 - dry adiabatic lapse rate (DALR), 368, 375
 - escape mechanisms, 411–416
 - exosphere, 371, 411, 415, 467, 545
 - heterosphere, 389
 - homosphere, 389
 - hurricane(s), 354, 375, 385
 - lapse rate, 372
 - mesopause, 370, 389
 - mesosphere, 369–370
 - mixing time, 388, 389
 - ozone, 367
 - pressure scale height, 357, 371, 372, 449
 - Rossby number, 377, 378, 383
 - saturated adiabatic lapse rate (SALR), 369
 - stratosphere, 369–370
 - superrotation, 384, 385
 - thermal structure, 368
 - thermosphere, 370, 371, 373, 376
 - tropopause, 365
 - troposphere, 367–369, 372, 386, 393, 556
 - winds, 361, 365, 372, 380, 382, 384, 385, 413, 416, 423, 424, 440, 448, 455, 464, 467, 480, 503, 509, 510, 512, 555, 558

- eddy/eddies, 356, 363–364, 380, 384
 - effects on heat transport, 363, 365
 - escape mechanisms, 411–416
 - exobase, 411–413, 446, 467, 547
 - heterosphere, 389
 - homopause, 389
 - homosphere, 389
 - isobars, 356, 359
 - isotherm(s), 357, 358, 360, 380, 381
 - jet stream(s), 365–367, 374, 380, 480
 - Jupiter
 - belts, 480, 482, 582, 678, 679, 681, 695, 779
 - brown barges, 480, 481
 - Great Red Spot (GRS), 480–482, 485, 493
 - helium deficiency, 496
 - mean molecular weight, 343, 478, 479
 - pressure scale height, 765
 - white spot(s), 538
 - winds, 480, 481, 500, 503, 509–511, 514
 - zones, 480–483, 487, 503, 509, 543, 587, 628
 - Mars
 - averaged temperatures, 381
 - circulation, 377, 378, 380–381, 385
 - composition, 387, 653, 666
 - dust devils, 372, 373
 - homopause, 389
 - ionosphere, 409–410, 467
 - lapse rate, 372, 373
 - mixing rate,
 - mixing ratio(s), 349, 407
 - Rosby number, 377, 378
 - stratomesosphere, 371
 - thermal structure, 368, 371
 - thermosphere, 371, 373, 376
 - troposphere, 371–373, 375, 407
 - meridional cross-section(s), 365, 366
 - mixing, 386–389
 - mixing ratio, 349, 391, 407
 - mixing time, 388, 389
 - Neptune, 395, 483, 492–494
 - pressure
 - baroclinic instabilities, 363
 - gradient(s), 342, 353–357, 359, 360, 376, 382, 383, 479
 - high/low, 356, 358, 359, 362, 364, 383, 481
 - refractive index, 344, 418, 421, 423
 - Saturn
 - features, 487, 490
 - structure, 486–489, 497, 515, 582
 - winds, 488, 509, 513, 515
 - seeing, 686
 - structure, 340–349, 368, 371, 375, 478, 483–486, 490, 497
 - subtropical fronts, 365, 366
 - thermal inertia, 371, 375, 378, 385–386
 - tides, 439, 586, 648
 - total density scale height, 412
 - Uranus, 483, 485, 490–491, 493, 496
 - Venus
 - circulation, 377, 378, 381–385
 - composition, 387
 - cryosphere, 376, 412
 - cyclostrophic balance, 382–384, 555
 - exobase altitude, 412
 - haze layer, 374, 381
 - homopause, 389
 - lapse rate, 372, 375
 - mesosphere, 375, 376, 555
 - Rosby number, 380, 382
 - stratomesosphere,
 - superrotation, 381–382, 384, 385
 - temperature, 349, 367, 372, 375, 376, 386, 393, 394, 412–414, 463, 555
 - thermal structure, 368, 375
 - thermosphere, 375–377
 - troposphere, 375, 556
 - Aurora(e), 434–436, 441, 449, 452, 454, 456, 469, 485, 488, 503, 504
 - Auroral oval, 416, 449, 450, 452–454, 456, 488, 503, 504, 507, 515, 584
 - Avogadro's number, 343, 346
- B**
- Bacon, R., 598
 - Baroclinic instability, 363
 - Bayeux tapestry, 610, 612
 - Benzene (C₆H₆), 562
 - Bessel, F.W., 601
 - Bielids, 631
 - Bipolar outflow(s), 701, 703
 - Birkeland currents, 453, 454
 - Bode, J.E., 676
 - Bolide(s), 631, 632, 635, 637, 638, 647, 659
 - Bolometer, 688
 - Boltzmann constant, 337, 338, 411, 702
 - Borelli, G., 600
 - Boundary current, 440, 441, 448, 451, 462, 464, 510
 - Bradley, J., 490
 - Brahe, T., 598–600
 - Breccia(s)
 - anorthositic, 666

- Breccia(s) (*cont.*)
 basaltic, 666
 genomict, 663
 monomict, 655, 663
 polymict, 655, 663
 regolith, 663, 664, 666
- Bright Star Catalog, 714
- Brown dwarf desert, 723, 740, 742, 777
- Brown dwarf(s), general
 definition, 758–761
 detection techniques, 723, 743, 744, 755
 evolution, 778
 origins, 776–781
 spectral characteristics, 650, 681, 693, 695, 760
- Brown dwarf(s), individual
 AB Pic B, 756
 Cha 110913-773444, 756
 GD 165 B, 760
 Gliese 229 B, 760
 GQ Lupi B, 322
 HD 137510 B, 753
 HD 168443 C, 753
 2MASS J0535-0546 A, 760
 2MASS J1207-3932 a, 755
 OGLE-TR-109B, 763
 Ross 458 C, 761
- Brownlee particles, 620, 639
- Brunt-Väisälä frequency, 386
- C**
- Calcium-aluminum inclusion(s) (CAI), 620, 640, 657–660, 662, 676
- Callisto (satellite, Jupiter IV)
 atmosphere, 545, 547
 domed crater(s), 543, 547
 interior, 555
 magnetic field, 545
 moment of inertia, 545, 553
 ringed plain(s), 541, 545
 sub-surface ocean, 555, 779
 surface feature(s), 358, 539
 Valhalla (ringed plain), 545, 546
- Campbell, W.W., 575
- Capture mechanisms, 535
- Carbon black, 627
- Carbon dioxide (CO₂), 348, 367, 370, 372, 373, 375, 376, 378, 387, 389–391, 393, 407, 408, 410, 411, 413, 469, 512, 547, 550, 552, 560, 565, 568, 619, 621, 780
- Carbon monosulfide (CS), 619
- Carbon monoxide (CO), 347, 372, 387, 407, 408, 412, 483, 547, 560, 565, 568, 619, 620, 651, 653, 657, 659, 661, 698, 760, 766
- Cardan, Jerome (Cardano, Girolamo), 598
- Cassini/Cassini's Division, 575, 576, 585
- Cassini, J.-D., 575
- Cassini state, 489
- Catalog of Meteorites, 649
- Centaur(s), 589, 609, 627, 680, 684, 685
- Ceres (asteroid dwarf planet), 522, 568, 589, 759
- Chaeremon the Stoic, 597
- Chalcophilic elements, 658
- Challis, J., 492
- Chaotic variation, 627, 697
- Chapman-Ferraro current, 440, 462
- Charge-exchange reactions, 467, 506, 514
- Charon (satellite, Pluto I)
 atmosphere, 528, 533, 568, 570
 composition, 478
 discovery, 528, 568, 589
 orbit/orbital
 elements, 477, 528, 549, 627
 properties, 475, 535, 570, 706, 723
 spin-orbit resonance, 568
- Chinook, 395
- Chiron (asteroid), 589, 609, 625, 627, 684, 685
- Chladni, E.F.F., 647
- Chondrites. *See under* Meteorites
- Chondrules
 composition, 652, 657, 658, 660
 origin, 658
- CHON particles, 620
- CH radical, 562
- Circulation
 Ferrel cell(s), 362–363
 global, 360–367
 Hadley cell(s), 361–363, 378
 parasitic cell(s), 363
 polar cell(s), 362–363
- Clairaut, A.-C., 601
- CN radical, 614
- Coefficient
 ablation, 635
 drag, 634
- Comet(s)/cometary
 attrition, 628
 coma, 613, 615, 616, 622, 685
 cometopause, 624
 composition, 614–622
 demise, 628–629

- dust, 608, 614, 617, 620, 622, 625, 628, 629, 639, 640
- envelope, 613, 614
- Halley group, 615, 626
- Jupiter family, 604, 615, 626, 628
- Kracht group, 604
- Kreutz group, 604
- lost, 608
- Marsden group, 604
- Meyer group, 604
- nucleus, 612, 614, 615, 620, 622–625, 627
- orbital elements, 608, 609
- orbit computation, 602, 605, 608
- origin, 535, 605, 625–628, 639
- parabolic (or long-period), 600, 603, 605, 614, 624, 626, 627, 700
- periodic, 600, 602, 603, 609, 610, 680
- probability of approach, 625–627
- specific angular momentum, 607
- structure, 612–614, 624
- surface ice, 547, 565, 568
- tail(s)
 - dust, 611, 614, 617, 622, 629
 - ion, 617, 618, 621, 623
 - virgin, 610, 617
- Comet of
 - 1577, 598–600, 609
 - 1680, 600
 - 1772, 601, 610
 - 371 B.C., 598, 601
 - the century, 604
- Comets (individual)
 - C/1996 B2 (Hyakutake), 616
 - C/1973 E1 (Kohoutek), 610
 - C/1980 E1 (Bowell), 605
 - C/1999 H1 (Lee), 617
 - C/1995 O1 (Hale-Bopp), 611, 613, 627
 - C/1997 P2 (Spacewatch), 605
 - C/2006 P7 (SOHO), 604
 - C/2004 Q2 (Machholz), 622
 - C/1908 R1 (Morehouse), 621
 - C/1961 R1 (Humason), 621
 - C/1577 V1 (Comet of 1577), 598–600, 609
 - C/2002 V1 (NEAT), 613
 - C/1996 Y1 (SOHO-6), 604
 - 3D/Biela, 610, 631
 - 3D/Biela (Biela's Comet of 1772), 601
 - D/1992 F2 (Shoemaker-Levy 9), 488
 - 19P/Borrelly, 614
 - 23P/Brorsen-Metcalf, 617, 618
 - 95P/Chiron, 609
 - 67P/Churyumov-Gerasimenko, 615
 - 79P/du Toit-Hartley, 609
 - 2P/Encke, 603, 609, 610, 615, 631
 - 21P/Giacobini-Zinner, 610, 615, 631
 - 26P/Grigg-Skjellerup, 609, 615
 - 1P/Halley, 602, 603, 610–612, 614–616, 619, 620, 631
 - 103P/Hartley, 615
 - 153P/Ikeya-Zhang, 617
 - 13P/Olbers, 609, 610
 - 29P/Schwassmann-Wachmann, 609
 - 73P/Schwassmann-Wachmann 3, 628
 - 109P/Swift-Tuttle, 609–611, 631
 - 9P/Tempel 1, 608, 609, 613, 615, 616, 618, 619
 - 55P/Tempel-Tuttle, 610, 631
 - 81P/Wild2, 614, 615, 640
 - 107P/Wilson-Harrington, 609
- Condensation sequence, 658, 701
- Conservation of angular momentum, 354, 383, 443, 701, 778
- Copernicus, N., 600
- Cordelia (satellite, Uranus VI), 527, 532, 578, 579
- Core accretion, 496, 497, 755, 770, 778
- Coriolis
 - force, 349–354, 356–360, 362, 363, 377–378, 380, 382, 383, 461, 479
 - parameter, 479
- Coriolis, G.G., 362
- Coronal
 - holes, 417, 449
 - mass ejection, 436, 449, 613
- Cosmic rays, 370, 404, 444, 515, 545, 619, 669, 673, 694, 700
 - albedo neutron decay (CRAND), 515
- Cosmogenic nuclei, 673
- Counter glow, 640
- Crater(s)
 - impact, 536, 539, 541, 551, 558, 566
 - volcanic, 536
- Cretaceous-Tertiary interface, 668
- Critical
 - frequency, 422, 498, 515
 - orbital radius, 570, 587
- Cryo-volcanoes, 558, 566, 567, 779
- Curie point, 423, 468, 544, 694
- Curvature drift, 437–439, 447, 448, 460, 510
- Cyanogen (C₂N₂), 560
- Cyclostrophic
 - balance, 382–384, 555
 - winds, 383
- Cyclotron
 - frequency, 498
 - motion, 428
 - radius, 428

D

Dactyl (243 Ida 1), 588, 689
 DALR. *See* Dry adiabatic lapse rate (DALR)
 Daörrffel, G.S., 600
 Daphnis (satellite, Saturn XXXV), 526, 531, 576, 577
 d'Arrest, Heinrich Louis (Ludwig), 492
 Darwin, G.H., 586
 de Laplace, Pierre Simon, 492
 Dead zone(s), 706, 777
 Debris disk(s), 704–706, 756, 769, 771
 4U 0142+61, 763
 Deimos (satellite, Mars II), 522, 524, 529, 533–535, 590, 690
 Del values, 655, 656, 674, 676
 Democritus, 598
 Descartes, Rene,
 Despina (Satellite, Neptune V), 527, 532, 582
 Deuterium, 412, 496, 639, 662, 676, 759
 Deuterium/hydrogen ratio (D/H), 662, 676, 700
 Diacetylene (C₄H₂), 561
 Diamagnetism, 430–431
 Diapir(s), 546
 Diffusion time, 388, 389, 496
 Diffusive equilibrium, 388
 Dione (satellite, Saturn IV), 525, 530
 plasma wake, 553
 Disk(s)
 dead zone, 706
 debris/remnant, 704–706, 756, 769, 771
 Dispersion relation, 420
 Dissociative recombination, 401, 404, 405, 410, 414, 469, 547, 548
 Doldrums, 361
 Doppler ranging, 688
 Dry adiabatic lapse rate (DALR), 368, 375
 Dungey cycle, 457–459, 510
 Dunham, D.W., 687, 691
 Dunham, J.B., 687
 Dust
 composition, 505, 675
 destinies, 640–642
 Dust devils, 372, 373
 Dystnomia (satellite, Eris I), 528, 533, 589

E**Earth**

atmosphere/atmospheric tides, 339, 340, 349, 365–367, 384, 390, 391, 393, 439, 470, 553, 599781
 aurora(e)/auroral oval, 416, 449, 450, 452–454, 456, 488, 503, 504

Caspian Sea, 556
 cycles
 carbon, 389–390
 nitrogen, 391, 392
 oxygen, 390–391
 sulfur, 391–393
 dipolar magnetic field, 423
 electrojets, 450, 454
 geocorona, 449
 geosynchronous orbit, 586
 ion
 loss mechanisms, 401, 403, 404
 molecular, 401, 404, 507
 production mechanisms, 400, 403, 405, 409–410
 ionosphere/ionospheric
 Birkeland current, 453, 454
 charge separation, 402
 D layer, 399, 404–406
 dominant ions, 409, 410
 dynamo, 439–440
 E layer, 403, 404
 electro jet(s), 453, 454
 electron density, 399, 400, 464
 exobase altitude, 412
 field-aligned current, 453, 459
 F layer, 399, 406
 Hall current, 453, 454
 joule heating, 434, 435, 452
 Pedersen current, 507
 Lake Ontario, 556, 557
 lower atmosphere properties, 371, 372
 lunar quiet current system, 440
 magnetic
 crustal anomalies, 468
 field, 402, 424, 433, 439, 440, 448–449, 456
 reconnection, 455–457, 459, 465, 469, 624
 storm(s), 441, 448–449, 452, 454
 substorm(s), 454–455
 magnetopause, 424, 440, 449, 452, 458–462
 magnetosheath, 424
 magnetosphere/magnetospheric
 Birkeland currents, 453, 454
 Chapman-Ferraro boundary current, 440
 convection, 449–450, 453, 460
 cross-tail current, 451, 455, 456, 465, 514
 diamagnetic ring current, 460
 magnetotail(s), 337, 424, 441, 449–450, 455–458, 460, 465, 502

- mass, 510, 511
- neutral point, 441
- neutral sheet, 424, 451
- plasma sheet, 451, 455–457, 459, 460
- plasmoids, 456, 459, 465
- polar cusp, 402, 416, 441, 452, 459
- radius, 339
- reconnection(s), 455–457, 459, 465, 469, 624
- ring current, 441–449, 452, 456, 460, 510, 511, 513, 514
- ring prospect,
 - solar disturbed current system, 452
 - solar quiet current system, 439
- solar constant, 367, 372
- Van Allen radiation belts
 - mirror points, 444, 460
 - pitch angles, 444
 - precipitation, 444
 - ring current, 447
- Edgeworth, K., 680
- Edgeworth-Kuiper Belt/Cloud, 489, 568, 615, 626, 680, 681, 685, 700, 722, 759, 779
 - shape and size, 626
- Effective gravity (gravitational acceleration), 352
- Einstein radius, 754
- Einstein ring, 753
- Elsasser number, 461
- Enceladus (satellite, Saturn II)
 - plumes, 512, 522, 550
 - tiger stripes, 512, 550
- Encke gap, 549, 576, 577, 582, 585
- Encke, J.F., 601
- Energy budget, 394
- Enstatite (MgSiO_3), 651, 660, 664, 698, 760
- Ephorus of Cyme, 598
- Epimetheus (satellite, Saturn XI), 525, 530
- Equation
 - Adams-Williamson, 494
 - of hydrostatic equilibrium, 342, 494, 759
- Equation(s) of state, 342, 346, 494
- Equatorial, 353, 363, 461, 480–482, 486, 487, 499, 501, 503, 510, 511, 514, 533, 544, 551, 560, 575, 578, 590, 703, 771
 - bulge, 353
- Equilibrium
 - hydrostatic, 340, 342, 494, 759
 - mechanical, 341
 - temperature, 337, 338
- Eris (dwarf planet)
 - albedo, 589
 - comparison with Pluto radius, 568
 - satellite, 527, 528
 - temperature, 589
- Escape velocity, 337, 479, 605, 628, 671
- Ethane (C_2H_6), 553–556, 559, 560, 562, 616, 619
- Ethanol ($\text{C}_2\text{H}_5\text{OH}$),
- Ethylene (C_2H_4), 560–562
- Ethyl radical(s) (C_2H_5), 561, 562
- Ethynyl radical (C_2H), 562
- Europa (satellite, Jupiter II)
 - atmosphere, 540
 - cratering density, 522
 - magnetic field, 540
 - mean density, 539
 - ocean, 539–541, 779
 - surface feature(s)
 - chaotic terrain, 539, 540
 - cracks, 539, 540
 - ice rafts, 539
 - lenticulae (dark spots), 540
 - linea, 540, 542
 - mountains, 539
 - ringed plains, 540, 541
 - wrinkle ridges, 539
- Eutectic mixture(s), 539
- Exobase, 371, 411–413, 446, 467, 547, 548
- Extra-ordinary ray(s), 498
- Extra-solar planet(s) (general)
 - chthonian, 765
 - detection techniques
 - astrometric, 743, 750–753
 - direct imaging, 755–756
 - gravitational lensing, 715, 743, 753–755, 763
 - pulsar timings, 756–757
 - radial velocity variations, 714, 743–746, 756, 770
 - transit photometry, 747–750, 765
 - direct imaging candidates, 755–756
 - free-floating, 723, 763, 777, 779
 - habitable zone, 770, 776, 779–781
 - host stars, 749
 - L-band simulated light curve, 749
 - multi-planet systems, 763
 - O-C analyzes, 757
 - occultation observations, 766
 - outgassing evidence, 560
 - sodium detection, 766
 - spectroscopy, 521
 - transit observations, 764

Extra-solar planet(s) (individual systems)

AB Pictoris, 756
v Andromedae, 767
μ Arae, 753
 55 Cancri, 747, 767–768
 α Centauri B, 744, 775, 776
 Cha 110913-773444, 756
ι Draconis, 757
ε Eridani, 704, 758, 770–771
β Geminorum, 753
 GJ 436, 766
 GJ 674, 770
 GJ 876, 770
 Gl 581, 779
 HAT P-1, 763
 HD 10180, 763
 HD 10647, 753
 HD 37124,
 HD 40307, 763
 HD 69830, 769–770
 HD 74156,
 HD 87833, 753
 HD 147513, 753
 HD 149026, 763
 HD 168443, 723, 753
 HD 188753A, 777
 HD 189733, 747, 763, 766
 HD 209458
 L-band simulated light curve, 749
 O-C analyses, 757
 occultation observations, 547, 766
 outgassing evidence, 560
 sodium detection, 766
 transit observations, 747, 764
 IL Aquarii, 770
 Kepler 347, 763, 768–769
 Kepler 368, 774–775
 2MASSW J1207334-393254, 755
 MOA-2003-BLG-53 (*see* OGLE-2003-BLG-235)
 OGLE-2003-BLG-235L, 755
 OGLE-2005-BLG-071L, 755
 OGLE-2005-BLG-169L, 755
 OGLE-2005-BLG-390L, 754, 755
 OGLE-2012-BLG-0026L, 755
 OGLE-MOA-2011-BLG-266L, 755
 OGLE-TR-10, 763
 OGLE-TR-56, 766
 OGLE-TR-109, 763
 OGLE-TR-111, 763
 OGLE-TR-113, 747
 OGLE-TR-132, 763
 51 Pegasi, 714

PSR 1257+12, 714, 756, 757, 763
 PSR 1719-1438, 746
 PSR B1620-26, 714, 757
ε Tauri, 762
 TrES-1, 747, 749, 771–772
 47 Ursae Majoris,
 WASP-1, 763
 WASP-17, 772–774
 XO-1,

F

Fayalite (Fe₂SiO₄), 621, 653
 Ferrel cell(s), 363, 378
 Field-aligned currents, 431–433, 453, 455, 456,
 459, 469, 507, 508, 511, 514
 Flamsteed, J., 490
 Föhn, 395
 Force(s)
 apparent, 349, 351
 centrifugal, 349–353
 centripetal, 428, 438, 570, 571
 Coriolis, 349–354, 356–360, 362, 363,
 377–378, 380, 382, 383, 461, 479
 disruptive differential, 571
 electric, 425, 427, 450
 fictitious, 349, 352
 friction, 355, 356, 377
 gravitational, 352, 427, 440, 570, 574, 641
 Lorentz, 425–426, 441, 461
 pressure gradient, 353–360, 376, 382, 383
 tidal, 550, 551, 570
 virtual, 349
 Formaldehyde (H₂CO), 619
 Forsterite (Mg₂SiO₄), 538, 620, 621, 760
 Frame(s) of reference, 349, 350
 Fugacity, 674

G

Galatea (Satellite, Neptune VI), 527, 532, 582
 Galilean satellites, 522, 523, 583
 Galilei, G., 599
 Galle, J.G., 492
 Ganymede (satellite, Jupiter II)
 atmosphere, 543
 crater(s)
 Achelaous, 543
 Gula, 543
 cratering densities, 522
 Galileo Regio, 542
 ice polymorph(s), 543
 magnetic field, 543

- mantle, 544
 - mean density, 476, 479, 495, 533, 538, 539, 543, 553
 - moment of inertia, 538, 539, 543, 545, 553, 675
 - sub-surface ocean, 555, 779
 - surface features
 - cratered plains, 542, 545
 - grooved terrain, 542, 544
 - palimpsest(s), 542, 543
 - penepalimpsest(s), 542, 543
 - ringed plain(s), 540, 541, 545
 - strike-slip faults, 540
 - sulcus/sulci, 542
 - Gas(es)
 - chemically active, 348
 - monatomic, 347, 348, 760
 - polyatomic, 348
 - Gas giants
 - albedos, 496
 - densities, 505
 - heat fluxes, 496
 - ionospheres, 497–498
 - pressure(s)
 - central, 463, 495
 - internal, 494–495
 - properties
 - orbital, 475, 535, 570
 - physical, 475, 529, 564, 568
 - temperature(s), 701
 - winds, 605
 - Gauss, K.F., 677
 - Gauss's law, 419
 - Gegenschein, 640
 - Geminids, 631
 - Georgium Sidus (Uranus), 490
 - Geostrophic
 - balance, 356–358, 382, 556
 - winds, 356–357
 - Germane (GeH₄), 483
 - Gradient drift, 437–438
 - Gram-molecular weight, 346
 - Gravitational constant, 412
 - Gravitational contraction, 778
 - Gravitational instability/instabilities, 497, 770, 778
 - Gravitational radius, 753
 - Greenhouse
 - effect, 394, 395, 494
 - runaway, 781
 - gases, 780
 - Guiding center, 429–430, 433, 436, 437, 441
 - Gulliver's Travels*, 528
 - Gyration frequency, 442
 - Gyromotion, 428–430, 433, 441–444, 508, 509
 - Gyroradius, 428, 429, 437, 442, 443
- ## H
- Habitable zone, 770, 776, 779–781
 - Hadley cell(s), 361–363, 377–380, 480, 555, 556
 - Hadley, G., 362
 - Hagecius, T., 599
 - Half-life/lives, 658, 670, 673
 - Hall, A., 533
 - Hall current, 434, 435, 453, 454, 507
 - Halley, E., 600
 - Harding, K.L., 677
 - HCN. *See* Hydrogen cyanide (HCN)
 - Heat capacity/capacities, 345, 347, 358, 363
 - Heat of ablation, 635
 - Helium, 339, 395, 479, 483–485, 488, 491, 496, 561, 673, 713
 - source, 496
 - Helium rain, 395, 484, 496
 - Herschel, C., 610
 - Herschel, J., 601, 610
 - Herschel, W., 490, 677
 - Hertzprung-Russell diagram, 761
 - for planets and brown dwarfs, 760
 - Hevel, J., 600
 - Hill, G.W., 362, 596
 - Hirayama, K., 681, 682
 - Hohmann orbital transfer, 570
 - Horse latitudes, 361
 - Horseshoe-shaped orbits, 549
 - Hot Jupiters, 497, 749, 755, 760, 762, 765–767, 772, 773
 - Hurricane(s), 354, 375, 385
 - Wilma, 354, 355
 - Huygens, C., 553
 - Hydrazine (N₂H₄), 483
 - Hydrodynamic outflow, 413
 - Hydrogen, 339, 412, 413, 449, 466, 469, 479, 483–486, 491, 500, 502, 509, 540, 559, 560, 563, 613, 614, 662, 676, 702, 713, 760, 765, 766
 - Hydrogen cyanide (HCN), 559, 560, 619
 - Hydrogen sulfide (H₂S), 391, 392, 480, 483, 619
 - Hydrostatic equilibrium, 340–342, 494, 759
 - Hydroxyl radical (OH), 407, 408
 - Hyperion (satellite, Saturn XVIII), 525, 530, 551, 552
 - moments of inertia, 552

I

- Iapetus (satellite, Saturn VIII), 523, 530, 551
 terrain, dark, 551
- Ice(s)
 polymorph (s), 543
 water, 379, 385, 542, 543, 566, 569, 577,
 583, 588, 616
 phase diagram, 545
- Ice giants, 706, 778
- Interplanetary magnetic field (IMF), 416, 424,
 454–457, 459, 463–469, 492, 542,
 623, 624, 694
- Interstellar medium, 619, 620, 662, 676, 703
- Inter-tropical convergence zone, 361
- Io (satellite, Jupiter I) atmosphere
 composition, 478
 cratering density, 522
 interior, 507, 535
 loss mechanisms
 hydrodynamic outflow, 505
 Jeans escape, 506
 sputtering, 506
 volcanism, 504, 506, 522
 mean density, 538
 orbit(al), 501, 504, 507, 524, 535, 538
 elements, 504, 524
 physical properties, 529, 535
 plasma torus, 505, 507, 510
 plumes, 504, 506, 537, 538, 550
 pressure scale height, 510
 sodium D-line emission,
 volatiles, 410
 volcano(es)
 Pele, 537
 Pillan Patera, 537
 Prometheus, 537
 Tvashtar Catena, 538
- Ionosphere(s)/ionospheric
 critical frequency, 422, 498, 515
 field-aligned current(s), 453
 index of refraction, 497
 loss mechanisms, 410
 plasma frequency, 422, 497, 498
 production mechanisms, 409–410
 reflection, 406
 refraction, 406, 421, 497
- Iron
 Curie point, 423
 meteorites (q. v.), 647–650, 652, 656, 657,
 660, 661, 663, 667–669, 671, 673,
 693, 699
- Isobaric processes, 346
 Isobars, 356–360, 379, 380

- Isochoric processes, 346
 Isotherms, 357, 358, 360, 380, 381

J

- Jacobi's integral, 607
- Janus (satellite, Saturn X), 492, 525, 530,
 552, 577, 585
- Jeans
 escape mechanism, 411–413
 length, 778
 mass, 778
 parameter, 411
- Jeans, J., 340, 778
- Jefferson, T., 647
- Jet streams, 365–367, 380
- Joule heating, 434, 435, 452
- Junge layer, 393
- Jupiter
 age, 479, 484
 albedo, 477
 atmosphere
 belts, 480, 482, 582, 678, 679, 681,
 695, 779
 blue-grey regions, 482
 brown barges, 480, 481
 color interpretation, 558
 composition, 478, 479
 Great Red Spot, 480–482, 485, 493
 Hadley cell interpretation, 480
 mean molecular weight, 343, 478, 479
 photochemical products, 483
 scale height, 478, 485
 structure, 483–486
 UV photolysis, 480
 white ovals, 480, 481
 winds, 480, 481, 500, 503, 509, 510, 514
 zones, 480–483, 487, 503, 509, 543,
 587, 628
 aurorae(e), 485, 488
 circulation, 479, 480, 483, 486
 composition, 478
 core, 483, 489, 496
 Coriolis parameter, 479
 density, 479
 escape velocity, 479
 flattening, 479
 global oscillations, 496
 gravitational acceleration, 479
 helium content, 479, 483–485
 internal structure, 483–485
 Io footprint, 507
 lightning, 482, 485

- liquid hydrogen layer, 483
 - Lorentz resonance, 574
 - magnetic field
 - compared to Earth's, 485
 - dynamo, 500
 - quasi-dipolar, 500
 - magnetodisk, 502
 - magnetosphere
 - corotational enforcement current, 511
 - inner, 485
 - interaction with Io, 503–511
 - outer, 483
 - Vasyliūnas cycle, 510–511
 - magnetotail, 502
 - mass, 484, 485
 - mean density, 479
 - metallic hydrogen, 483, 485, 486
 - migration, 779
 - nuclear reactions, 496
 - occultation, 478
 - orbit, 475, 482
 - plasmoids, 510
 - pressure(s)
 - central, 495
 - internal, 494–495
 - scale height, 496
 - radiation
 - belts, 514–515
 - decametric (DAM), 498, 508–509
 - decimetric (DIM), 500
 - excess, 496–497
 - synchrotron, 500
 - radius, 765
 - resonance, 535, 609, 678, 681, 684, 695, 697, 706
 - ring(s)
 - Amalthea, 524, 537, 575
 - Gossamer, 541, 574, 575
 - Halo, 573, 574
 - Thebe, 524, 529, 573–575
 - Rosby number, 479
 - rotation periods, 479
 - satellites
 - direct, 478, 535, 626
 - Galilean, 478, 522, 535, 536, 583
 - orbits, 535, 536
 - physical properties, 535
 - retrograde, 535, 549
 - temperature(s), 479, 496, 497
- K**
- Kamacite crystals, 667
 - Keeler gap, 576, 577
 - Keeler, J.E., 575
 - Kepler, J., 533, 600, 601, 612, 677, 714, 744, 752, 755, 762, 763, 768–769, 774–775, 777
 - Kirkwood gaps, 582, 678, 695, 697
 - Kozai mechanism, 722, 773
 - Kreutz, H.C.F., 604, 628
 - Kronos (Saturn), 486
 - Kuiper Belt. *See* Edgeworth-Kuiper Belt/Cloud
 - Kuiper, G.P., 478, 564, 680
 - Kursk magnetic anomaly, 468
- L**
- Lagrangian points, 475, 684, 757
 - Lalande, J.-J., 490, 493
 - Lapse rate
 - adiabatic
 - dry adiabatic lapse rate (DALR), 368, 375
 - saturated adiabatic lapse rate (SALR), 369
 - environmental, 369
 - Latent heat, 369, 385
 - Law(s)
 - Gauss's, 419
 - Kepler's 3rd, 601, 744, 752
 - Newton's 2nd, 419–421
 - Newton's 3rd, 615, 634
 - Titius-Bode, 493, 676, 677
 - L dwarf(s), 760, 761
 - GD 165B, 760
 - Least squares computational scheme, 677
 - Lemonnier, P.C., 490
 - Leonids, 630, 631
 - Le Verrier/Leverrier, Urbain-Jean-Joseph, 492, 493
 - Light curve modeling, 748, 749
 - Russell-Merrill model, 750
 - Wilson-Devinney program, 748, 750
 - Lithophilic elements, 658
 - Lorentz force, 425–426, 441, 461
 - Lorentz resonance, 574
- M**
- Mab (satellite, Uranus XXVI), 527, 532, 564, 580
 - water ice absorption, 564
 - Maestlin (Mästlin), Michael, 599
 - Magnetic
 - bottle(s), 442, 444–446
 - loss cone, 446

Magnetic (*cont.*)

- bow shock, 424, 457, 459, 465, 466, 503, 623, 624, 633
 - field(s)
 - boundary current, 440–441, 448, 451, 462, 464, 510
 - crustal, 461, 468, 469
 - curvature drift, 437–439, 447, 448, 460, 510
 - diamagnetic currents, 431, 440, 441, 460, 464, 465
 - dipolar, 423, 458, 500, 512, 514
 - dynamo model, 423, 458, 461, 462, 468, 544, 694
 - $E \times B$ drifts, 402, 431–435, 451, 460, 470, 471
 - field-aligned current(s), 431–433, 452, 453, 456, 507, 508, 511, 514
 - gradient drift, 437–439, 447, 448, 460, 510
 - north/south-seeking poles, 424, 450, 458, 499
 - pressure, 464, 624
 - quasi-dipolar, 500
 - mirror(s)
 - pitch angle, 429, 444–447, 470, 501
 - point, 444, 445, 470
 - ratio, 446, 470
 - moment, 443, 462
 - ring current, 441–448, 511
 - storms, 441, 448–449, 452, 454–458
 - tail(s), 444, 455, 466
- Magnetism, remanent, 461, 468, 544, 694
- Magnetopause, 424, 440, 449, 452, 453, 457, 459, 460, 462, 466, 469, 502, 503, 511–514, 544, 614
- Magnetopause nose, 459
- Magnetosphere, 339, 395, 399–471, 475, 478, 486, 488, 494, 496, 498–516, 535, 540, 543, 547, 552, 584, 614, 622–624
- Magnetotactic bacteria, 665
- Marcy, G., 714, 764, 767
- Mars
 - Argyre basin, 468
 - atmosphere, 349, 367, 368, 371–374, 376–381, 385–387, 389, 391, 407–408
 - aurora(e), 469
 - core, 462, 468, 469, 544
 - dust devils, 372, 373, 379
 - Hellas basin, 468
 - hydrosphere, 674
 - ice cap, 470
 - impact basins, 468, 692, 693
 - ionosphere
 - dominant ions, 409, 410
 - loss mechanisms, 410
 - production mechanisms, 409–410
 - iron content, 468, 544
 - lower atmosphere properties, 371, 372
 - magnetic field
 - crustal anomalies, 468
 - dynamo, 468, 469
 - global dipole moment, 467
 - global upper limit, 467
 - reconnection, 469
 - strengths, 468
 - magnetism, remanent, 468
 - magnetosphere, 467–469
 - induced, 468, 469
 - north-south dichotomy, 468
 - regolith oxidation, 469
 - satellites, 522, 524–525, 528–535, 568, 587, 677
 - spiders,
 - suprathermal atoms and ions, 414
 - water, 385, 407, 408, 470
- Marsden, B.G., 533, 601, 603, 604, 608–610
- Mass function, 635, 647, 714, 715, 764
- Ma Tuan-Lin, 597
- Maxwellian distribution, 340, 411, 412, 414
- Maxwell, J.C., 575
- Maxwell's equations, 417–420
- Mayer, T., 490
- Mayor, M., 714, 722
- Mean free path, 340, 371, 412, 763
- Medicean satellites (Galilean satellites, *q.v.*), 498, 501, 522, 523, 535, 583
- Mercury
 - Elsasser number, 461
 - Lorentz force, 461
 - magnetic field
 - axial tilt, 458
 - dipole moment, 458, 461
 - dipole offset, 458
 - models, 461
 - origin, 653, 665
 - quadrupole term, 458
 - reconnection, 458
 - magnetopause, 457–460, 462, 466
 - magnetosphere, 458–462
 - bow shock, 457, 465
 - molten core,
 - “Metals,” in stellar astrophysics, 713

- Meteor(s)
 ablation rate, 635
 bolide(s) (fireballs), 631, 632, 637, 647, 659
 brightness distribution, 639
 brightness variation, 636
 fast vs. slow, 635, 636
 fragmentation, 625, 636, 673
 ionization probability, 636
 luminous efficiency, 635
 shower, 630–632
 sporadic, 632, 633, 637, 647
 visibility, 632, 633, 636, 637
- Meteor crater(s), Ries, 667
- Meteorite(s) (individual)
 Abee (EH4), 661
 ALH 84001 (SNC), 649, 665, 666
 ALH A77005 (SNC), 664
 Allende (CV3, 2), 651, 659, 660, 671, 672, 675, 798
 Bruderheim (L3), 651, 661
 Chassigny (SNC), 651, 652, 664
 EET A79001 (SNC), 664
 Governador Valadares (SNC), 665
 Henbury (IIIAB), 651, 668
 Lafayette (SNC), 668
 MET 01210 (lunar), 666
 Millarville (IVA), 649
 Nakhla (SNC), 651, 664, 665, 671
 NWA 7325 (Mercury), 667
 QUE 94201 (SNC), 674
 Shergotty (SNC), 651, 652, 661, 664, 674
 Sikhote-Alin (IIAB), 668, 669
 Zagami (SNC basaltic shergottite), 665, 666, 673, 674
- Meteorite Hills Antarctica, 653, 664, 666
- Meteorites (general)
 age(s)
 cosmic ray exposure, 669, 673, 694
 crystallization, 674
 differentiation, 674
 ejection, 666, 674
 formation, 674
 gas retention, 669, 672–673
 mean isochron, 672
 radiogenic, 653, 669, 673
 terrestrial, 673
 breccia(s) (q.v.), 652, 655, 663, 664, 666, 671
 calcium-aluminum inclusions (CAI), 620, 640, 657–660, 662, 676
 chondrule(s), 639, 640, 651, 654, 658–660, 662, 675, 703
 classification, 648, 650–652
 deuterium/hydrogen ratio, 662, 676
 equilibration, 661
 falls and finds, 649, 653, 670
 isochrones, 671, 761
 kamacite bands, 667
 nomenclature, 648–649
 origin(s), 661, 665, 669–672
 petrographic/petrologic properties, 650–651
 shock stages, 648
 strewn field, 659
 weathering grade, 648
- Meteorites (groups/classes/clans/ types)
 acapulcoites, 663, 675
 achondrites, 651–653, 659, 661–663, 665, 671, 675, 694, 698
 aerolites (stony), 648
 angrites, 651, 663, 675
 Antarctic, 648, 666
 ataxites, 656, 668
 aubrites, 656, 664
 brachinites, 663, 675
 carbonaceous chondrites
 CH (High-Fe), 659
 CI (Ivuna), 659, 698
 CK (Karoonda), 659
 CM (Migei), 659
 CO (Ormans), 659
 CR (Renazzo), 659
 CV (Vigano), 659
 chassignite(s), 652, 665, 698
 chondrites
 carbonaceous (v.s.), 533, 651, 657, 659–661, 672, 674, 675, 696–699
 enstatite (v.i.), 651, 660, 698
 ordinary (v.i.), 651, 660, 671, 675, 684, 698
 Rumurutiite (R), 661
 differentiated, 650–656, 662
 origin, 652, 653
 differentiated silicate-rich (DSR), 650–652, 655, 662–667, 674, 701
 diogenites, 651–653, 655, 663, 665, 675, 694
 enstatite(s)
 EH (high iron), 651, 660, 661, 671
 EL (low iron), 651, 660, 664
 eucrites, 651–653, 655, 663, 675, 694
 HED, 653, 663, 694–696
 hexahedrites, 653, 656, 667
 howardites, 651–653, 655, 663, 675, 694, 696
 IAB, 651, 656, 661, 663, 668

- Meteorites (groups/classes/clans/ types) (*cont.*)
- IIAB, 651, 656, 663, 668, 669
 - IIIAB, 651, 656, 663, 668
 - III CD, 651, 656, 661, 668
 - IVA, 651, 656
 - igneous, 650–652, 654, 663–666, 698
 - iron(s), 648–653, 656–661, 663, 664, 666–669, 671–674, 693
 - cooling rates, 658, 668
 - lodranites, 663, 675
 - lunar, 649, 651, 653, 666, 675
 - Martian (SNC), 665, 666, 673–675
 - mesosiderites, 651, 652, 655–557, 663, 664, 671, 675
 - microbreccias, 652
 - minichondrule, 651, 659
 - moldavite, 667
 - nakhilites, 652, 664, 671, 675
 - non-differentiated, 650
 - octahedrites, 653, 667, 668
 - plestitic, 656, 668
 - ordinary chondrites
 - H (high iron), 660
 - L (low iron), 660
 - LL (low iron, metal), 651, 653, 660, 662
 - orthopyroxenite, 665
 - pallasites, 651, 652, 655–657, 663, 664, 698
 - plestites, 668
 - primitive achondrites (IAB clan), 661
 - refractory-rich, 651, 658, 659
 - shergottites, 652, 664, 665, 671, 675
 - Shergotty-nakhla-chassigny (SNC), 651, 652, 663–666, 671, 673–675
 - siderites (irons), 648
 - siderolites (stony-irons), 648
 - tektite(s), 667, 675
 - ureilites, 652, 655, 664, 675
 - very-low-titanium (VLT) basalt, 666
 - volatile-rich, 651, 659
 - winonaites, 663, 675
- Meteoritical Bulletin*, 649
- Meteoroid, 370, 513, 552, 570, 573, 583, 584, 632–635, 638, 639, 648, 673, 676, 696
- Meteor shower(s), 629–632, 637, 647, 669
- radiant(s), 630–633
- Methane (CH₄), 348, 395, 482, 483, 491, 493, 494, 550, 553–556, 558–561, 567, 569, 619, 625, 723, 756, 760, 780
- clathrate hydrate, 560
- Methanol (CH₃OH), 619, 627
- Methylacetylene (CH₃C₂H), 660, 662
- Methylene (CH₂), 561
- Methylidyne (CH), 661
- Methyl radical(s) (CH₃), 559–563
- Metis (satellite, Jupiter XVI), 524, 529, 573
- Micrometeorites
 - asteroidal/cometary dust ratio, 640
 - Brownlee particles
 - chondritic porous (CP), 639
 - chondritic smooth (CS), 639
 - destinies,
 - origins, 639
- Milankovic cycles, 380
- Millisecond pulsars, 756, 757
- Mimas (Saturn I), 512, 523, 525, 530, 585
- Minerals
 - anhydrous, 675
 - anthracene, 621
 - augite, 664, 665
 - enstatite, 664
 - feldspar, 664
 - ferrosilite, 621
 - forsterite, 538, 621, 760
 - hibonite, 658
 - kamacite, 654, 667, 668, 694
 - magnesite, 621
 - magnetite, 421, 544, 639, 664, 665
 - maskelynite, 664, 674
 - melillite, 658
 - nontronite, 621
 - olivine, 620, 621, 627, 651, 653, 655, 661, 663–665
 - orthopyroxene, 620, 655, 661, 663, 665
 - perovskite, 658, 760
 - pigeonite, 655, 664
 - plagioclase, 663–665, 667
 - siderite, 621, 648
 - smectite, 621
 - spinel, 658
 - taenite, 668
- Minor Planet Center, 609, 628, 679, 680, 685, 687
- Minor planets. *See* Asteroids
- Miranda (satellite, Uranus V)
 - corona(e), 521
 - the “racetrack,” 563
 - scarp(s), 563
 - scissor fault, 563
- Mission(s)
 - Cassini
 - Huygens probe, 475, 521, 553, 554, 556, 558, 563
 - orbiter, 480, 482, 486, 487, 512, 521, 549–553, 576–579, 583, 584
 - CoRoT, 714, 763

- Deep Impact, 608, 618–620
 - extended mission (EPOXI), 615
- Deep Space 337, 614
- Friendship, 371
- GAIA, 752
- Galileo
 - orbiter, 523, 537, 539, 541, 571, 573, 574
 - Probe, 374, 483, 484
 - thermal imagers, 536
- Giotto, 614
- Herschel Space Observatory, 627
- HIPPARCOS, 686, 723, 752, 753, 771
- Hubble Space Telescope (HST), 371, 374, 478, 488, 491, 504, 541, 569, 580, 581, 583, 584, 704, 747, 748, 753, 764, 771
- International Comet Explorer (ICE), 615
- International Space Station, 371, 435, 436
- Juno, 475, 482, 677, 690, 691
- Kepler, 714, 744, 749, 755, 768, 774
- Long Duration Exposure Facility
 - satellite, 639
- Magellan, 462, 773
- Mariner(s), 361, 458
- Mars Express, 412
- Mars Global Surveyor (MGS), 467, 469
- Mars Opportunity Rover, 649
- Mars Spirit Rover, 649
- Messenger, 458, 460
- MOST, 771
- NEAR Shoemaker, 683, 690
- New Horizons, 475, 482, 570, 573, 582
- Pathfinder, 468
- Phobos, 522, 524, 529, 533–535, 590, 690
- Pioneer(s)
 - Pioneer 10, 475, 482
 - Pioneer 11, 475, 482, 488, 499, 511
 - Pioneer Venus, 375, 385, 464, 466
- Rosetta, 615
- Solar Dynamics Observatory, 621
- Space Interferometry (SIM), 752
- Spitzer Space telescope, 551, 620, 627–629, 747, 766, 771, 772
- Stardust, 614, 640
- Stardust NExT, 614
- Suisei, 615
- Ulysses, 475, 482, 624
- Vega, 615, 620, 704, 758, 777
- Venera, 375, 383, 385
- Venus Express, 376, 465, 466
- Viking(s),
 - Orbiter(s),
- Vostok, 371
- Voyager(s)
 - Voyager 1, 475, 482, 487, 488, 546
 - Voyager 2, 475, 485, 490, 491, 493, 494, 511, 563–567, 578, 580–583
- Mixing
 - lines, 675
 - ratio, 349, 391, 407
 - time, 388, 389
- Moldavite, tektites, 667
- Molecular
 - charge transfer, 400–403, 410, 411, 623
 - dissociation, 401, 507
 - ionization, 404
 - ions, 401, 404, 507
 - photodissociation, 369, 393, 399, 403, 404, 407, 413, 415, 513, 548, 561
 - photoexcitation, 395
 - thermal speeds, 506
 - viscosity, 356
 - weight, 337, 338, 342–344, 346, 352, 372, 388, 478, 479
- Molecular cloud(s)
 - density, 639, 702, 703, 715
 - mass, 704, 715
 - radius, 702, 703, 715
- Monatomic gas(es), 347, 348
- The Moon, 440, 461, 478, 503, 504, 515, 521–523, 528–563, 567, 572, 580, 582, 585–591, 598, 599, 649, 659, 700, 706, 757, 764
 - orbital evolution, 586
- Müller, Johann (Regiomontanus), 598
- N**
- Naiad (satellite, Neptune III), 527, 532, 581
- Natural Satellite Data Center,
- Neptune
 - angular diameter, 493
 - atmosphere
 - Great Blue/Dark Spot, 493, 494
 - the scooter, 494
 - composition, 395, 478, 493
 - discovery, 156, 492, 493, 523
 - electrolytic sea, 494
 - excess radiation, 394, 496–497
 - greenhouse effect, 394, 395, 494
 - magnetic field, 494
 - magnetosphere, 494
 - mean density, 476, 493
 - pressure(s)
 - central, 463, 495
 - internal, 494, 495
 - properties, 499

- Neptune (*cont.*)
 rings
 arcs, 771
 clumpiness, 771
 satellites
 orbits, 475, 489, 492, 493
 physical properties, 475
 winds, 494
 Nereid (satellite, Neptune II)
 orbital elements, 523, 527, 532
 orbital properties, 528, 565
 Neutral point, 441
 Newton, I., 600
 Newtons 2nd law, 419, 427, 428
 Nice model, 706
 Nitrogen (N, N₂)
 sublimation, 565, 568
 triple point, 566
 Noise, 498, 686, 743, 776
 improvement, 686, 743, 775
 Nüremberg Chronicles, 612
- O**
- Oberon (satellite, Uranus IV), 527, 532, 587
 Observatories
 Harvard college, 747
 Paris, 714
 Sproul, 713
 Occultation(s), 343, 344, 478, 487, 533, 547,
 552, 568, 578, 581, 583, 588, 627,
 686, 747, 749, 750, 766, 769, 772
 OGLE. *See* Optical Gravitational Lensing
 Experiment (OGLE)
 OGLE-2003-BLG-235, 755
 Ohmic losses, 434
 Olbers, H.W.M., 677
 Olivine, 461, 620, 621, 627, 651, 653–655,
 661, 663–665, 693, 694, 698
 Oort cloud
 inner, 625, 626, 700, 701
 outer, 625, 626, 700, 701
 population, 626, 700
 radius, 626
 Oort, J., 610, 615, 626, 700
 Ophelia (satellite, Uranus VII), 527, 532,
 578, 579
 Optical depth, 344, 578, 584, 704
 Optical Gravitational Lensing Experiment
 (OGLE), 747, 754, 755, 763, 766
 Optics
 active, 686
 adaptive, 689, 723
 Ordinary ray(s), 498
- Origen, 597
 Orthopyroxene, 620, 655, 661, 663, 665,
 675, 694
 Osculating orbits, 609
 Osiris, 765
 Oxygen, 371, 387, 390–391, 393, 399, 407,
 412, 415, 466, 469, 502, 506, 507,
 509, 513, 552, 621, 658, 660,
 663–665, 674, 675
 Oxygen ions, 502, 507
 Oxygen isotopes, 660, 663–665, 675
 Ozone (O₃)
 concentration, 370
 production, 369, 370
- P**
- Palaeomagnetic data, 423
 Pan (satellite, Saturn XVIII), 526, 531, 576
 Pandora (satellite, Saturn XVII), 526, 531, 577
 Parker spiral, 465
 Particle precipitation, 444, 446, 449, 460
 Paul of Tarsus (St. Paul), 648
 Pedersen current, 434, 435, 453, 454
 Perfect gas law, 342, 344
 Perseids, 630–632
 Petrography, 650, 665
 Petrologic classes, 652, 654, 659, 661, 663, 675
 Petrology, 650, 694
 Phobos (satellite, Mars I), 524, 529, 533–535
 decaying orbit, 534, 535
 Phoebe (satellite, Saturn IX), 525, 530, 551,
 578, 587
 Phosphine (PH₃), 483
 Phosphorescence, 395
 Photodissociation, 369, 393, 399, 403, 404,
 407, 413, 415, 513, 548, 561
 Photolysis, 393, 399, 407, 408, 480, 540, 547,
 556, 559, 560, 616
 Piazzi, G., 676
 Planet/planetary
 definition(s), 351, 384, 588, 589,
 758–761, 781
 distinction from brown dwarfs, 652, 656,
 715, 722, 723, 740, 741, 758–761
 evolution, 484, 489, 492, 705
 migration, 489, 706, 756, 761
 origins
 core-accretion, 755, 770, 778
 gravitational instability, 497, 778
 Plasma frequency, 417–423, 497, 498
 Plasmoids, 456, 459, 465
 Plessite(s), 668
 Pliny the Elder, 598

- Plutino(s), 568, 589, 680, 681, 685, 759
- Pluto (dwarf planet)
- albedo markings, 569
 - atmosphere, 569
 - comparison with Eris, 568, 589
 - comparison with Triton, 568–570, 587, 589
 - discovery, 568
 - interior, 568
 - orbit/orbital
 - elements, 570
 - properties, 568, 570
 - resonance with Neptune, 568
 - satellites, 568–570
 - seasons, 568–570
 - spin-orbit coupling, 568
 - temperature(s), 569
- Plutoid, 680, 759
- Polar cusp, 402, 416, 425, 441, 452, 459
- Polarization drift, 435–437
- Polarized waves, 420–423
- Polyacetylene(s), 562
- Polycyclic aromatic hydrocarbon (PAH), 621, 665
- Portia (satellite, Uranus XII), 527, 532, 580, 581
- Posidonius, 598
- Poynting–Robertson drag, 642
- Poynting–Robertson effect, 640, 642, 700
- Pressure
- density relation, 342, 344
 - equation, 342
 - gradient, 342, 355, 357
 - force, 353–360, 376, 382, 383, 479
 - high/low, 356, 358–360, 362–364, 481, 560, 773
 - partial, 387, 388, 517, 565
 - radiation, 573, 613, 640–642, 697, 701
 - scale height, 343, 344, 357, 371, 372, 376, 402, 412, 449
- Prometheus (satellite, Saturn XVI), 526, 531, 537, 576, 577
- Propane (C₃H₈), 559, 560, 562
- Propylene (C₃H₆), 562
- Proteus (satellite, Neptune VIII), 523, 527, 532
- Proto-planetary disks (proplyds)
- dead zone, 706
 - detection techniques, 757
 - coronographic, 713
 - heterogeneity, 675
 - lifetime, 778
 - mass, 681, 701, 706
 - model, 705, 706
 - Orion, 704
- Puck (satellite, Uranus XV), 527, 532, 581
- Pulsar timings, 756–757
- Q**
- Quadrans muralis, 631
- Quasi-trapped particles, 460
- Quenching, 394, 395
- R**
- Radiants, 362, 367, 630–631, 633
- Radiation
- coefficient, 477, 642
 - excess, 394–395, 496–497
 - pressure, 573, 613, 640–642, 697, 701
- Radioactive isotopes
- aluminum 26 (²⁶Al), 658, 694
 - argon 39 (³⁹Ar), 561, 673
 - rubidium 87 (⁸⁷Rb), 669–673
 - uranium 238 (²³⁸U), 672
- Radioactivity, 522, 523
- Radio AM band, 406
- Radio wave reflection, 406
- Ratio of specific heats, 345, 347
- Red giant wind, 703
- Refraction, 344, 406, 420–22, 497, 498, 585
- Refractivity scale height, 344
- Refractory material, 658, 701
- Regiomontanus (Johann Müller), 598
- Rhea (satellite, Saturn V), 523, 525, 530, 549, 552, 553, 577, 578
 - atmosphere, 552, 553
- Ries crater, 667
- Right-hand rule, 351–353, 425, 430, 432, 433, 438–440, 511
- Ring/ring structures
- albedos, 496, 564, 581, 683, 688, 696
 - current, 441–449, 452, 456, 460, 510, 511, 513, 514
 - Jupiter, 572–575, 582, 583
 - Neptune, 574, 581–582, 586
 - origin, 570–572, 582–586, 663, 701
 - particle sizes, 574
 - resonances, 574, 585
 - Rhea, 552, 578
 - Saturn, 486–489, 496, 511–515, 551, 552, 576, 577, 582–584
 - scattering function, 585
 - spiral waves, 585
 - Uranus, 491, 563, 578, 579, 583, 586
 - vertical oscillations, 585
- Roche limit, 570–572, 586

- Rosalind (satellite, Uranus XIII), 527, 532, 580, 581
- Rossby number (R_o), 377, 378, 380, 382, 383, 479, 480
- Rossiter/Rossiter-McLaughlin effect, 764, 772
- Rotational flattening, 353
- Rothmann, C., 599
- Russell, H.N., 750
- S**
- Sallamu, 601
- Saturated adiabatic lapse rate (SALR), 369
- Saturn
- albedos, 496, 564
 - atmosphere/atmospheric
 - belts, 444, 479, 481, 487, 493, 514
 - storms, 487
 - velocities, 575
 - zones, 487
 - aurora(e), 488
 - color index, 715, 723
 - cosmic ray albedo neutron decay (CRAND), 515
 - electroglow, 488, 491
 - excess radiation, 394–395, 496, 497
 - helium abundance, 484–485
 - helium rain, 395, 496
 - magnetic field
 - dipole offset, 458, 499
 - quadrupole term, 458
 - magnetodisk, 512–514
 - magnetosphere, 511–515
 - mass, 489
 - metallic hydrogen, 485
 - obliquity, 489
 - period(s)
 - revolution, 680
 - rotational, 511, 515
 - plasma disk, 487
 - poles, 488
 - precessions, 489, 695
 - pressure(s)
 - central, 495
 - internals, 495
 - radiation, 394, 496
 - kilometric (SKR), 515
 - radiation belts, 515
 - radius, 476, 477, 511, 551
 - resonance, 489, 585, 695, 706
 - ring(s)
 - A ring, 548, 551, 576, 582
 - associated satellites, 573
 - B ring, 585
 - Cassini Division, 575, 585
 - composition, 583
 - C ring, 576, 585
 - discovery, 548, 585
 - Encke gap, 549, 576, 577, 582
 - E ring, 512
 - F ring, 576, 577, 582
 - G ring, 576
 - Keeler gap, 576, 577
 - kinked, 582
 - Maxwell gap, 576
 - Phoebe, 551, 578
 - resonances, 489
 - spokes, 578, 584
 - temperatures, 578
 - satellites
 - co-orbital, 549
 - orbits, 475, 489, 512
 - physical properties, 530–531
 - propeller-shaped moonlets, 548
 - temperature(s), 484, 494
- Scattered disk, 626, 685
- Schwarzschild radius, 753
- Seneca, 598, 681
- Shepherding satellites, 577, 579–582
- Siderophilic elements, 657
- Silica (SiO_2), 635, 657
- Silicate emission, 620
- Silicates, 372, 504, 566, 620, 621, 625, 639, 652, 655, 661, 664, 667, 769
- SIMBAD database, 714
- Sirocco, 395–396
- Snell's law, 421
- The snow line, 625, 662, 755, 772, 775, 778
- Sodium (Na), 460, 503–506, 509, 512, 536, 619–620, 633, 657, 658, 747, 766, 767, 773
- Sodium chloride (NaCl), 505–507
- Solar apex, 625
- Solar constant(s), 367, 372
- Solar wind, 415–417, 423–425, 440, 441, 448–450, 454, 455, 458–460, 462–469, 500, 503, 510, 512–515, 545, 614, 617–619, 623, 624, 640, 662, 663, 697, 701
- Spallation products, 673
- Specific angular momentum, 607
- Specific heat(s)
 - capacity, 347
 - per unit mass, 347, 348
- Spectrograph(s)/spectrographic CORALIE, 743

- echelle, 743
- ELODIE, 743
- precision, 686, 743, 752, 764
- Spectroscopic, 745, 764
 - binaries, 723, 743, 744, 746, 777
- Sputtering, 415, 466, 469, 506, 513, 540, 545, 547, 552, 553, 574
- Stable isotopes
 - argon, 674
 - oxygen,
 - strontium,
- Standard mean ocean water (SMOW), 674
- Star clusters
 - Hyades, 762
 - NGC 6791, 762
 - Praesepe (M44), 762
 - 47 Tuc, 762
- Star of Bethlehem, 597, 612
- Stars (classes)
 - brown dwarfs (q.v.), 722, 723, 740, 741, 750, 752, 758, 759, 762, 763, 777
 - double-line (SB2), 723, 746
 - K-stars, 756
 - L dwarfs, 760, 761
 - methane dwarf, 760
 - M-stars, 745
 - neutron stars, 756, 763
 - red dwarfs, 770
 - red giants, 703
 - single-line (SB1), 743–745
 - solar-like, 743
 - spectroscopic binaries, 745–746
 - T dwarfs, 740, 760, 761
 - white dwarfs, 723, 757, 758, 762
- Stars (individual)
 - AB Pictoris, 755
 - ν Andromedae, 767
 - Barnard's Star, 713
 - 55 Cancri, 747, 767–768
 - α Centauri B, 744, 775
 - Cha 110913-773444, 756
 - CM Draconis, 756
 - ϵ Eridani, 704, 758, 770–771
 - Gliese 876, 753
 - GQ Lupi, 755
 - HD 69830, 769–770
 - HD 168443, 723, 753
 - HD 189733, 747, 763, 766
 - HD 209458, 714, 747–750, 760, 761, 764–767, 773
 - Kepler 11, 763, 768–769
 - Kepler 32, 774–775
 - Lalande 21185, 753
 - LP 475-242, 762
 - α Lyrae (Vega),
 - β Lyrae, 677, 746
 - 2MASSW J1207334-393254, 755
 - OGLE-TR-10, 763
 - 51 Pegasi, 649, 714
 - β Pictoris, 704, 713, 758
 - α Piscium Austrini (Fomalhaut), 631, 704
 - PSR 1257+12, 714, 756, 763
 - PSR B1620-26, 714, 757
 - PSR J1719-14, 746, 757
 - Ross 458, 761
 - Ross 780, 753
 - SCR J1845-6357, 783,
 - SN 1572, 598
 - 34 Tauri(Uranus), 490
 - ϵ Tauri, 762
 - TrES-1, 747, 771–722
 - 4U 0142+61, 763
 - XO-1, 788,
- Star(s)/stellar (general)
 - limb-darkening, 763, 764
 - line profiles, 744, 771
 - magnetic activity cycles, 744
 - metallicity/metallicities, 762, 770
 - rotation, 744, 772, 774, 776
 - spectral types, 650, 755, 761, 770, 780
- Sulfur, 391–394, 409, 483, 502, 504, 507, 536, 537, 544, 661
 - boiling point, 536
- Sulfur dioxide (SO₂), 372, 387, 391, 505, 506, 512, 537, 619
- Sulfur oxide (SO), 504
- Sung-shih annals, 602
- Sun/solar
 - apex, 625
 - corona(e), 416, 614, 639
 - F-corona, 639
 - disturbed current(s), 452
 - flare(s), 404, 406, 417, 439, 448, 662
 - flux, 372, 441, 448, 641
 - luminosity, 338, 641, 687, 781
 - nebula, 489, 583, 621, 625, 657, 660, 661, 672, 674, 675, 694, 700–703
 - photon momentum, 640
 - quiet current(s), 439
 - wind, 415–417, 423–425, 440, 441, 448–450, 454, 455, 458–460, 463–469, 500, 503, 509–515, 545, 614, 616–618, 623, 624, 640, 662, 663, 697, 701
- Supernova, 600, 703, 756, 763
- Survey(s), 490, 537, 569, 600, 690, 723, 740, 742, 747, 749, 752, 754, 756, 762, 763, 772

Survey(s) (*cont.*)

optical gravitational lensing experiment
(OGLE), 747, 754, 755, 764, 766

Swift, J., 528, 774, 775

Szebehely, V., 586, 587

T

Taenite crystal(s), 667

Taylor instability, 481

T dwarf(s), 740, 760, 761

Gliese 229B, 324

Tektite(s), 667, 675

Telescopes

Canada–France–Hawaii (CFHT), 714

Frederick C. Gillette (Gemini North), 620

Hubble space (HST), 371, 374, 478, 488,
491, 504, 569, 580, 581, 704, 747,
748, 753, 762, 764, 771

Keck, 581, 764

Spitzer Space, 551, 620, 627–629, 747, 766,
771, 772

Subaru, 620

Temperature(s)

effective, 477, 496, 497, 715, 749

equilibrium, 337, 338, 367, 491, 496, 536,
568, 688, 760, 765, 773, 779, 780

Tethys (satellite, Saturn III), 512, 514, 523,

525, 530, 548, 549, 553, 575,
577, 583

Tetraacetylene (C₈H₂), 562

Thalassa (Satellite, Neptune IV), 527, 532, 581

Thebe (satellite, Jupiter XIV), 524, 529,
573–575

Thermal

circulation, 357–358, 362

inertia, 371, 375, 378, 385–386

wind, 358–360, 380

Tholins, 627

Tide(s)/tidal

action, 522, 628

bulge, 572, 586

critical density, 571

critical distance, 570, 571, 587

disruption criteria, 570, 572

friction, 572, 586

instability, 570

raising force, 570, 586

Roche limit, 570–572, 586

Tisserand, F.F., 608, 627

Tisserand invariant/parameter, 608, 627

Tisserand's criterion, 608

Titan (satellite, Saturn VI)

atmosphere

aerosols, 559

chemistry, 562

cloud(s), 554, 556

composition, 560

Hadley cells, 555

polar storms, 556, 559

primordial, 560

superrotation, 555

thermosphere, 555, 563

cat scratches, 558

crustal material, 541

cryovolcano, 779

dendritic channels, 556

hydrogen torus, 563

hydrological cycle, 555, 559

Kraken Mare, 556

lake(s), 555–559

Ligeia Mare, 556, 557

Love number, 555

Menrva Crater, 558

methane cycle, 558–559

obliquity, 555

Ontario Lacus, 556

orbit/orbital

elements, 525

properties, 530, 558

panoramic view, 554

polar lakes, 558

rotation period, 555

sand seas, 558

seasons, 555, 556

Sotra Facula, 558

subsurface ocean, 555, 557

surface images, 553–559, 563

temperature(s), 555, 563

tide(s)/tidal, 553

heating, 583

water retention, 560, 563

Titania (satellite, Uranus III), 521, 523,
527, 532

Titius von Wittenberg, Johann Daniel, 676

Toscanelli, P., 598

Triacetylene (C₆H₂), 562

Triton (satellite, Neptune I)

atmosphere/atmospheric

cloud(s), 566

composition, 690

pressure, 565

thermosphere, 566

cantaloupe terrain, 567

color, 565, 567

cryovolcano(s), 566, 567

- geyser(s), 566, 567
 - impact crater(s), 566
 - Mazomba, 566
 - mean density, 566
 - nitrogen geyser(s), 566
 - orbit/orbital
 - elements, 527
 - precession, 565
 - properties, 532
 - seasons, 565
 - Rauch Planitia, 567
 - surface relief, 566
 - synchronous rotation, 567
 - Trochoid, 432, 437
 - T Tauri stage, 662, 697
 - T'ung-k'ao annals, 602
 - Twain, Mark (Samuel Clemens), 611
- U**
- Umbriel (satellite, Uranus II), 523, 527, 532
 - albedo, 564
- Units
- astronomical unit (au), 339, 367, 417, 476, 490, 502, 601, 603, 604, 609, 610, 613, 622–628, 641, 662, 676–681, 683, 685, 686, 690, 694, 695, 698–700, 703, 704, 715, 744, 745, 755, 757, 761, 763, 765–767, 769–774, 776–780
 - mho (conductance), 459
 - siemens (conductance), 459
- Universal gas constant, 343
- Uranus
- angular size, 490
 - atmosphere, 490, 491
 - brightness (opposition magnitude), 490
 - color,
 - composition, 583
 - density profiles, 490
 - discovery, 490, 676
 - electroglow, 491
 - He/H ratio, 490
 - helium abundance, 491
 - internal pressure, 485, 495
 - lightning, 491
 - magnetic field, 491
 - magnetosphere, 395, 496, 499, 500
 - ring(s)
 - discovery, 491, 578, 581
 - smoke, 583
 - variation, 491
 - rotation, 490, 491
 - satellites
 - orbits, 490
 - physical properties, 532
 - seasons, 490
 - superheated water, 491
- V**
- Van de Kamp, P., 713
 - Vector, 341, 342, 349–351, 354, 355, 360, 418–420, 425–429, 461, 471, 489, 511, 607
 - cross-product, 350, 428
 - The Venerable Bede, 598
 - Venus
 - atmosphere/atmospheric, 464
 - loss, 466–467
 - cycles, 409
 - sulfur, 393, 394
 - dominant ions, 410
 - exosphere, 467
 - heat flux, 468, 484, 496, 536
 - induced magnetosphere, 463–466
 - ionopause, 464, 465
 - ionosphere/ionospheric
 - diamagnetic current, 464
 - dominant ions, 410
 - electron density, 464
 - loss mechanisms, 410–411
 - plasma pressure, 464
 - processes, 463
 - production mechanisms, 410–411
 - solar wind interaction, 463
 - limit on magnetic dipole moment, 462
 - lower atmosphere properties, 371, 372
 - magnetic field pressure, 463
 - magnetocavity, 465
 - magnetospheric bow shock, 465, 466
 - rotation, 463, 465
 - surface cratering, 522
 - Vesta (asteroid), 653, 677, 684, 689–698
 - Virial theorem, 702
 - Volatile substance, 658
 - Volcano(es), 391, 505, 506, 536, 558, 566, 620
 - von Purbach, G., 598
 - Von Zach, Baron Franz Xaver (János Ferenc), 676
- W**
- Water
- ice, 379, 385, 540, 542, 543, 545, 553, 565, 566, 568, 577, 583, 588, 616, 627

- Water (*cont.*)
 vapor, 349, 367, 379, 385, 413, 485, 512,
 627, 780
- Whipple, F., 614
- Widmanstätten figures, 667
- Wildt, R., 483, 490
- Winds
 Chinook, 395
 Coriolis parameter, 479
 cyclostrophic, 382–384, 555
 easterlies, 362, 365, 480
 Föhn, 395
 geostrophic, 356–360, 385, 479
 Sirocco, 395
 solar, 415–417, 423–425, 439, 441,
 448–451, 454, 455, 458–460,
 463–469, 500, 503, 509–515, 545,
 614, 616–618, 623, 624, 640,
 661–663, 697, 701
- thermal, 358–360, 380
 trade, 360–362, 365, 384, 385, 480
 westerlies, 360–365, 385, 480
 zonally averaged distribution, 366
- Y**
 Yarkovsky effect, 695, 697, 700
 Yarkovsky force, 700
- Z**
 Zodiacal light, 639