## Appendices

### Appendix A: Physical Constants

<table>
<thead>
<tr>
<th>Physical quantity</th>
<th>Symbol</th>
<th>Value</th>
<th>cgs units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed of light in vacuum</td>
<td>$c$</td>
<td>$2.9979 \times 10^{10}$</td>
<td>cm s$^{-1}$</td>
</tr>
<tr>
<td>Elementary charge</td>
<td>$e$</td>
<td>$4.8023 \times 10^{-10}$</td>
<td>statcoulomb</td>
</tr>
<tr>
<td>Electron mass</td>
<td>$m_e$</td>
<td>$9.1094 \times 10^{-28}$</td>
<td>g</td>
</tr>
<tr>
<td>Proton mass</td>
<td>$m_p$</td>
<td>$1.6726 \times 10^{-24}$</td>
<td>g</td>
</tr>
<tr>
<td>Proton/electron mass ratio</td>
<td>$m_p/m_e$</td>
<td>$1.8361 \times 10^3$</td>
<td></td>
</tr>
<tr>
<td>Gravitational constant</td>
<td>$G$</td>
<td>$6.6720 \times 10^{-8}$</td>
<td>dyne cm$^2$ g$^{-2}$</td>
</tr>
<tr>
<td>Boltzmann constant</td>
<td>$k_B$</td>
<td>$1.3807 \times 10^{-16}$</td>
<td>erg K$^{-1}$</td>
</tr>
<tr>
<td>Planck constant</td>
<td>$h$</td>
<td>$6.6261 \times 10^{-27}$</td>
<td>erg s</td>
</tr>
<tr>
<td>Rydberg constant</td>
<td>$R_H$</td>
<td>$1.0974 \times 10^5$</td>
<td>cm$^{-1}$</td>
</tr>
<tr>
<td>Bohr radius</td>
<td>$a_0$</td>
<td>$5.2918 \times 10^{-9}$</td>
<td>cm</td>
</tr>
<tr>
<td>Electron radius</td>
<td>$r_e$</td>
<td>$2.8179 \times 10^{-13}$</td>
<td>cm</td>
</tr>
<tr>
<td>Stefan–Boltzmann constant</td>
<td>$\sigma$</td>
<td>$5.6774 \times 10^{-5}$</td>
<td>erg cm$^{-2}$ s$^{-1}$ K$^{-4}$</td>
</tr>
<tr>
<td>1 electronvolt</td>
<td>$\epsilon_e$</td>
<td>$1.6022 \times 10^{-12}$</td>
<td>erg</td>
</tr>
<tr>
<td>1 Ångström</td>
<td>$\lambda_e$</td>
<td>$1.1604 \times 10^4$</td>
<td>K</td>
</tr>
<tr>
<td>1 jansky</td>
<td>$\nu_e$</td>
<td>$2.4180 \times 10^{14}$</td>
<td>Hz</td>
</tr>
<tr>
<td>1 solar flux unit</td>
<td>(AU)</td>
<td>$10^{-8}$</td>
<td>cm</td>
</tr>
<tr>
<td>1 astronomical unit</td>
<td>(AU)</td>
<td>$10^{-19}$</td>
<td>erg s$^{-1}$ cm$^{-2}$ Hz$^{-1}$</td>
</tr>
<tr>
<td>Solar radius</td>
<td>$R_\odot$</td>
<td>$6.96 \times 10^{10}$</td>
<td>cm</td>
</tr>
<tr>
<td>Solar mass</td>
<td>$M_\odot$</td>
<td>$1.99 \times 10^{33}$</td>
<td>g</td>
</tr>
<tr>
<td>Solar gravitation</td>
<td>$g_\odot$</td>
<td>$2.74 \times 10^4$</td>
<td>cm s$^{-2}$</td>
</tr>
<tr>
<td>Solar escape speed</td>
<td>$\nu_\infty$</td>
<td>$6.18 \times 10^7$</td>
<td>cm s$^{-1}$</td>
</tr>
<tr>
<td>Solar age</td>
<td>$t_\odot$</td>
<td>$4.60 \times 10^9$</td>
<td>years</td>
</tr>
<tr>
<td>Solar radiant power</td>
<td>$L_\odot$</td>
<td>$3.90 \times 10^{33}$</td>
<td>erg s$^{-1}$</td>
</tr>
<tr>
<td>Solar radiant flux density</td>
<td>$F_\odot$</td>
<td>$6.41 \times 10^{10}$</td>
<td>erg cm$^{-2}$ s$^{-1}$</td>
</tr>
<tr>
<td>Solar constant (flux at 1 AU)</td>
<td>$f_\odot$</td>
<td>$1.39 \times 10^{6}$</td>
<td>erg cm$^{-2}$</td>
</tr>
<tr>
<td>Solar solid angle (at 1 AU)</td>
<td>$\Omega_\odot$</td>
<td>$6.76 \times 10^{-5}$</td>
<td>ster</td>
</tr>
<tr>
<td>Photospheric temperature</td>
<td>$T_{\text{phot}}$</td>
<td>$5.762$</td>
<td>K</td>
</tr>
</tbody>
</table>
### Appendix B: Plasma Parameters

<table>
<thead>
<tr>
<th>Physical quantity</th>
<th>Definition</th>
<th>Numerical formula (cgs units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal pressure</td>
<td>$p_{th} = 2 n_e k_B T_e$</td>
<td>$2.76 \times 10^{-16} n_e T_e$ (dyne cm$^{-2}$)</td>
</tr>
<tr>
<td>Magnetic pressure</td>
<td>$p_m = B^2 / (8 \pi)$</td>
<td>$3.98 \times 10^{-2} B^2$ (dyne cm$^{-2}$)</td>
</tr>
<tr>
<td>Plasma-$\beta$ parameter</td>
<td>$\beta = (\rho_{th} / \rho_m)$</td>
<td>$6.94 \times 10^{-15} n_e T_e B^{-2}$</td>
</tr>
<tr>
<td>Thermal scale height</td>
<td>$\lambda_T = 2 k_B T_e / (\mu c m_p g_{\odot})$</td>
<td>$4.73 \times 10^3 T_e$ (cm)</td>
</tr>
<tr>
<td>Electron thermal velocity</td>
<td>$v_{Te} = (k_B T_e / m_e)^{1/2}$</td>
<td>$3.89 \times 10^5 T_e^{1/2}$ (cm s$^{-1}$)</td>
</tr>
<tr>
<td>Ion thermal velocity</td>
<td>$v_{Ti} = (k_B T_i / m_i)^{1/2}$</td>
<td>$9.09 \times 10^5 (T_i / \mu)^{1/2}$ (cm s$^{-1}$)</td>
</tr>
<tr>
<td>Ion mass density</td>
<td>$\rho = n_i m_i = n_i \mu m_p$</td>
<td>$1.67 \times 10^{-24} \mu_1 (g)$</td>
</tr>
<tr>
<td>Sound speed</td>
<td>$c_S = (\gamma p_{th} / \rho)^{1/2}$</td>
<td>$1.66 \times 10^4 (T / \mu)^{1/2}$ (cm s$^{-1}$)</td>
</tr>
<tr>
<td>Alfvén speed</td>
<td>$\nu_A = (4 \pi \mu m_p n_i)^{1/2}$</td>
<td>$2.18 \times 10^{11} B (\mu n_i)^{-1/2}$ (cm s$^{-1}$)</td>
</tr>
<tr>
<td>Electron plasma frequency</td>
<td>$f_{pe} = (n_e e^2 / \pi m_e)^{1/2}$</td>
<td>$8.98 \times 10^n T_e^{1/2}$ (Hz)</td>
</tr>
<tr>
<td>Ion plasma frequency</td>
<td>$f_{pi} = (n_i Z^2 e^2 / \pi \mu m_p)^{1/2}$</td>
<td>$2.09 \times 10^5 Z (n_i / \mu)^{1/2}$ (Hz)</td>
</tr>
<tr>
<td>Electron gyrofrequency</td>
<td>$f_{ge} = e B / (2 \pi m_e c)$</td>
<td>$2.80 \times 10^8 B$ (Hz)</td>
</tr>
<tr>
<td>Ion gyrofrequency</td>
<td>$f_{gi} = Z e B / (2 \pi m_p c)$</td>
<td>$1.52 \times 10^5 Z B / \mu$ (Hz)</td>
</tr>
<tr>
<td>Electron collision frequency</td>
<td>$\nu_{ce} = 1 / f_{pe}$</td>
<td>$3.64 \times 10^n n_e \ln \Lambda T_e^{-3/2}$ (Hz)</td>
</tr>
<tr>
<td>Ion collision frequency</td>
<td>$\nu_{ci} = 1 / f_{pi}$</td>
<td>$5.98 \times 10^{-2} n_i \ln \Lambda Z T_e^{-3/2}$ (Hz)</td>
</tr>
<tr>
<td>Electron collision time</td>
<td>$\tau_{ce} = 1 / \nu_{ce}$</td>
<td>$2.75 \times 10^{-1} T_e^{3/2} / (n_e \ln \Lambda)$ (s)</td>
</tr>
<tr>
<td>Ion collision time</td>
<td>$\tau_{ci} = 1 / \nu_{ci}$</td>
<td>$1.67 \times 10^1 T_e^{3/2} / (n_i \ln \Lambda)$ (s)</td>
</tr>
<tr>
<td>Electron gyroradius</td>
<td>$R_e = v_{Te} / (2 \pi f_{ge})$</td>
<td>$2.21 \times 10^{-2} T_e^{1/2}$ (cm)</td>
</tr>
<tr>
<td>Ion gyroradius</td>
<td>$R_i = v_{Ti} / (2 \pi f_{gi})$</td>
<td>$9.49 \times 10^{-1} T_i^{1/2} \mu^{1/2} Z^{-1} B^{-1}$ (cm)</td>
</tr>
<tr>
<td>Debye length</td>
<td>$\lambda_D = (k_B T_e / 4 \pi n_e e^2)^{1/2}$</td>
<td>$6.90 \times 10^0 T_e^{1/2} n_e^{-1/2}$ (cm)</td>
</tr>
<tr>
<td>Dreicer field</td>
<td>$E_D = Z e \ln \Lambda / \lambda_D^2$</td>
<td>$1.01 \times 10^{-11} Z \ln \Lambda n_e T_e^{-1}$ (statvolt cm$^{-1}$)</td>
</tr>
<tr>
<td>Electrical conductivity</td>
<td>$\sigma = n_e e^2 \tau_e / m_e$</td>
<td>$6.96 \times 10^7 \ln \Lambda Z T_e^{-1}$ (Hz)</td>
</tr>
<tr>
<td>Magnetic diffusivity</td>
<td>$\eta = e^2 / (4 \pi \sigma)$</td>
<td>$1.03 \times 10^{12} \ln \Lambda Z T_e^{3/2}$ (cm$^2$ s$^{-1}$)</td>
</tr>
<tr>
<td>Magnetic Reynolds number</td>
<td>$R_m = lv / \eta$</td>
<td>$9.73 \times 10^{-13} lv T_e^{3/2} \ln \Lambda^{-1}$</td>
</tr>
<tr>
<td>Thermal Spitzer conductivity coeff.</td>
<td>$\kappa = lv / \eta$</td>
<td>$9.2 \times 10^{-7}$ (erg s$^{-1}$ cm$^{-1}$ K$^{-7/2}$)</td>
</tr>
<tr>
<td>Thermal conductivity</td>
<td>$\kappa = \kappa T_e^{5/2}$</td>
<td>$9.2 \times 10^{-7} T_e^{5/2}$ (erg s$^{-1}$ cm$^{-1}$ K$^{-1}$)</td>
</tr>
<tr>
<td>Radiative loss rate</td>
<td>$\lambda_0 (T \approx 1$ MK)</td>
<td>$1.2 \times 10^{-22}$ (erg s$^{-1}$ cm$^3$)</td>
</tr>
<tr>
<td>Coronal viscosity</td>
<td>$\nu_{visc}$</td>
<td>$4.0 \times 10^{13}$ (cm$^2$ s$^{-1}$)</td>
</tr>
</tbody>
</table>

- cgs units: length $l$ (cm), mass $m$ (g), time $t$ (s), Temperature $T$ (K), magnetic field $B$ (G), densities $n_i, n_e$ (cm$^{-3}$).
- Adiabatic index: $\gamma = \gamma_p / \gamma_e = (N + 2) / N = 5 / 3 = 1.67$.
- Ion/proton mass ratio $\mu = m_i / m_p$: $\mu(H) = 1$, $\mu(He) = 4$, $\mu(Fe) = 56$.
- Mean molecular weight in corona (H:He = 10:1): $\mu_C = (10 \times 1 + 1 \times 4) / 11 = 1.27$.
- Coronal approximation (full ionization): $n_i = n_e$.
- Coulomb logarithm: $\ln \Lambda = 23 - \ln (n_i T_e^{-3/2}) \approx 20$ for $T_e \lesssim 10$ eV.
- Charge state: proton $\rightarrow Z = 1$, Fe IX $\rightarrow Z = 8$. 


Notation

Physical Units Symbols

A  ampère, unit for electric current (SI)
Å  ångström = 10^{-8} cm
AU astronomical unit
C  coulomb, unit for electric charge (SI)
cm centimeter, unit for length (cgs)
dyne unit for force (cgs)
derg unit for energy (cgs)
eV electronvolt; keV, MeV, GeV
g gram, unit for mass (cgs); kg (SI)
G gauss, unit for magnetic field (cgs); kG
J joule, unit for energy (SI)
Hz hertz = s^{-1}, unit for frequency (SI); kHz, MHz, GHz
K kelvin, unit for temperature (cgs, SI); MK
m meter, unit for length (SI); μm, mm, cm, dm, km, Mm
N newton, unit for force (SI)
rad radian, unit angle π
s second, unit for time (cgs, SI)
ster steradian, unit for solid angle (ster = rad^2)
T tesla, unit for magnetic field (SI)
V volt, unit for electric potential (SI)
W watt, unit for power (SI); kW, MW

Latin Symbols

A  magnetic vector potential function
A  area (cm^2)
a  amplitude (cm)
B  magnetic field vector, magnetic induction
B  magnetic field strength (G)
B(p,q) beta function
C  count rate (s^{-1})
C  contour curve of surface integral
D  fractal dimension
D  decay time (s)
D(x,t) diffusion constant (cm^2 s^{-1})
D  total derivative \( \partial / \partial t + v \partial / \partial x \)
d  distance (cm)
E  total energy (erg)
E_{kin} kinetic energy (nonrelativistic \( E_{kin} = \frac{1}{2}mv^2 \))
E_m magnetic energy \( E_m = B^2/8\pi \)
E_{th} thermal energy \( E_{th} = k_B T_e \)
E_X total radiated energy in X-rays (erg)
EM emission measure \( EM = n^2 z \) (cm^{-3})
ε  electric field strength (statvolt cm^{-1})
e  elementary electric charge
\begin{itemize}
  \item $e$: energy (erg)
  \item $F$: photon flux (erg s\textsuperscript{-1} cm\textsuperscript{-2} keV\textsuperscript{-1})
  \item $F$: force (dyne)
  \item $F_d$: dynamic friction force (dyne)
  \item $F_s$: static friction force (dyne)
  \item $f$: frequency (Hz)
  \item $f(x)$: function
  \item $G$: gravitational constant
  \item $g$: gravitational acceleration (cm s\textsuperscript{-2})
  \item $h$: height (cm)
  \item $h$: Planck constant
  \item $I$: current (statampere)
  \item $I$: intensity of radiation (erg s\textsuperscript{-1} cm\textsuperscript{-2} Hz\textsuperscript{-1} ster\textsuperscript{-1})
  \item $j$: current density vector
  \item $k_B$: Boltzmann constant
  \item $L, l$: length (cm)
  \item $L_X$: luminosity in X-rays
  \item $L$: Laplacian
  \item $M, m$: mass (g)
  \item $m$: magnitude
  \item $m_e$: electron mass
  \item $N(x)$: differential frequency distribution of parameter $x$
  \item $N^{\text{cum}}(x)$: cumulative frequency distribution of parameter $x$
  \item $n$: number
  \item $n_e$: electron number density (cm\textsuperscript{-3})
  \item $P$: peak energy dissipation rate (erg s\textsuperscript{-1})
  \item $P$: time period (s)
  \item $P$: perimeter (cm)
  \item $P(x)$: probability distribution function of parameter $x$
  \item $P(\nu)$: power spectrum versus frequency $\nu$
  \item $p$: powerlaw index of power spectrum $P(\nu) \propto \nu^{-p}$
  \item $p$: powerlaw index of waiting time distribution $N(p) \propto (\Delta t)^{-p}$
  \item $p$: pressure (dyne cm\textsuperscript{-2})
  \item $q$: ratio
  \item $q$: electric charge
  \item $R, r$: radius or range (cm)
  \item $R_m$: magnetic Reynolds number
  \item $R_{\odot}$: solar radius
  \item $R(T)$: instrumental temperature response function
  \item $r$: rate (s\textsuperscript{-1})
  \item $S$: surface (specifying a surface integral)
  \item $S$: source function
  \item $S$: size
  \item $s$: path distance along curve (cm)
  \item $T$: time duration (s)
  \item $T$: temperature (K)
  \item $T_e$: electron temperature (K)
  \item $t$: time (s)
  \item $t_s$: saturation time (s)
  \item $V$: volume (cm\textsuperscript{3})
  \item $\mathbf{v}, v$: velocity (cm s\textsuperscript{-1})
  \item $v_A$: Alfvén speed
  \item $W$: energy release rate (erg s\textsuperscript{-1})
  \item $W_s$: saturation energy rate (erg s\textsuperscript{-1})
\end{itemize}
Notation

- \( w \)  width (cm)
- \( x \)  spatial coordinate or position
- \( y \)  spatial coordinate or position
- \( z \)  spatial coordinate (along line-of-sight)
- \( z \)  height difference

Greek Symbols

- \( \alpha \)  powerlaw index of differential frequency distribution
- \( \alpha_A \)  powerlaw index of area \( A \)
- \( \alpha_P \)  powerlaw index of peak energy rate \( P \)
- \( \alpha_E \)  powerlaw index of total energy \( E \)
- \( \alpha_S \)  powerlaw index of size \( S \)
- \( \alpha_T \)  powerlaw index of time duration \( T \)
- \( \alpha \)  angle (deg)
- \( \alpha \)  correlation coefficient
- \( \beta \)  powerlaw index of cumulative frequency distribution
- \( \beta \)  correlation coefficient
- \( \Gamma \)  growth rate \((1/\tau_G)\)
- \( \gamma \)  powerlaw index of power spectrum
- \( \gamma \)  powerlaw index of photon spectrum
- \( \gamma \)  correlation coefficient
- \( \gamma \)  damping constant
- \( \nabla \)  nablа operator
- \( \Delta \)  Laplace operator
- \( \Delta \)  difference
- \( \Delta t \)  waiting time between events \((\Delta t = t_{i+1} - t_i)\)
- \( \delta \)  powerlaw index of electron spectrum
- \( \varepsilon \)  infinitesimal length scale
- \( \varepsilon \)  photon energy \( \varepsilon = h\nu \) (keV)
- \( \varepsilon_x \)  hard X-ray photon energy \( \varepsilon = h\nu_x \)
- \( \eta \)  magnetic diffusivity
- \( \eta \)  energy decay rate \((\text{erg s}^{-1})\)
- \( \Theta(x) \)  Heavyside step function
- \( \theta, \vartheta \)  angle
- \( \kappa \)  diffusion constant
- \( \Lambda(T) \)  radiative loss function
- \( \lambda \)  wavelength (cm)
- \( \lambda \)  event occurrence rate \((1/\Delta t)\)
- \( \mu \)  mean (of Gaussian distribution)
- \( \nu \)  frequency \((\text{s}^{-1} = \text{Hz})\)
- \( \nu_{\text{cisc}} \)  coronal viscosity
- \( \rho \)  mass density, \( \rho = n m \)
- \( \rho \)  random number
- \( \sigma \)  standard deviation (of Gaussian distribution)
- \( \sigma \)  electrical conductivity
- \( \tau \)  time scale \((\text{s})\)
- \( \tau_G \)  growth time
- \( \tau_d \)  decay time
- \( \tau_{\text{rise}} \)  rise time
- \( \Phi \)  magnetic flux \((\text{Mx} = G\text{ cm}^2)\)
- \( \varphi \)  azimuthal angle
Acronyms

1-D, 2-D, 3-D  one-, two-, three-dimensional
ACE  Advanced Composition Explorer
AE  Auroral Electron jet index
AGN  Active Galactic Nuclei
BATSE  Burst And Transient Source Experiment (on CGRO)
BCS  Bragg Crystal Spectrometer (on Yohkoh)
BCSW  Bak–Chen–Scheinkman-Woodford (1993) model
Cassini  Cassini orbiter, part of the Cassini–Huygens space probe
CCD  Charge Coupled Device (camera)
CME  Coronal Mass Ejection
DC  Direct Current
CCC  Cross-Correlation Coefficient
CEOF  Complex Empirical Orthogonal Function analysis (method)
CGRO  Compton Gamma Ray Observatory (spacecraft)
Cluster  Cluster (ESA space mission)
CV  Cataclysmic Variable stars (Canes Venatici type stars)
DCIM  DeCIMetric bursts
DEM  Differential Emission Measure (distribution)
DKA  Drift-Kinetic Alfvén vortex motions
DNA  DeoxyriboNuclei Acid
EIT  Extreme-ultraviolet Imaging Telescope (on SoHO)
ETH  Eidgenössische Technische Hochschule (Zurich, Switzerland)
EUV  Extreme UltraViolet
EUVE  Extreme UltraViolet Explorer (spacecraft)
EUVI  Extreme-UltraViolet Imager (on SECHI/STEREO)
FBR  Fourier-Based Recognition (method)
Fermi  Fermi Gamma-ray Space Telescope (spacecraft)
FFT  Fast Fourier Transform
FWHM  Full Width Half Maximum
FSOC  Forced and/or Self-Organized Criticality model
FUV  Far UltraViolet imager (on IMAGE spacecraft)
GEOTAIL  magnetospheric satellite
GOES  Geostationary Orbiting Earth Satellite (spacecraft)
GRANAT  International Astrophysical Observatory (Russian spacecraft)
GRB  Gamma-Ray Burst spectrometer (on ULYSSES spacecraft)
GSFC  Goddard Space Flight Center (NASA)
Hα  hydrogen line (6562.8 Å)
HSP  High-Speed Photometer (on HST spacecraft)
HST  Hubble Space Telescope (spacecraft)
HXRBS  Hard X-Ray Burst Spectrometer (on SMM)
HXR  Hard X-Rays
HXT  Hard X-ray Telescope (on Yohkoh)
IBM  International Business Machines Corporation
ICA  Independent Component Analysis (method)
ICE  International Cometary Explorer (ISEE-3 spacecraft)
IMAGE  Imager for Magnetopause-to-Aurora Global Exploration (spacecraft)
IMF  Interplanetary Magnetic Field
IMP  Interplanetary Monitoring Platform (spacecraft)
ISEE-3  International Sun/Earth Explorer 3 (ICE spacecraft)
IT  Intermittent Turbulence
JPL  Jet Propulsion Laboratory (Pasadena, USA)
KLT  Karhunen–Loève Transform (method)
LASCO  Large Angle Spectrometric CORonagraph (on SOHO)
LMXB  Low-Mass X-ray Binary star
LMC  Large Magellanic Cloud (a galaxy)
MDI  Michelson Doppler Imager (on SoHO)
MHD  Magneto-HydroDynamics
MLT  Multiple Level Tracking (method)
MW  MicroWaves
MW-S  MicroWave Spike bursts
NASA  National Aeronautics and Space Administration
NGC  New General Catalogue (of nebulae and star clusters)
NGDC  National Geophysical Data Center (USA)
NICMOS  Near Infrared Camera and Multi-Object Spectrometer (on HST)
NIXT  Normal Incidence X-Ray Telescope (rocket instrument)
NOAA  National Oceanic and Atmospheric Administration (USA)
OFC  Olami–Feder–Christensen (1992) model
OSO-7  Orbiting Solar Observatory 7 (satellite)
PCA  Principal Component Analysis (method)
PHEBUS  Payload for High Energy BUrst Spectroscopy (on GRANAT)
POD  Proper Orthogonal Decomposition (method)
POLAR  Polar satellite
PSR  PulSaR
QPO  Quasi-Periodic Oscillations (in stellar data)
Ranger-8  lunar spacecraft
RCL  Resistor (R), Capacitor (C), inductor (L) circuit
RHESSI  Reuven Ramaty High Energy Solar Spectroscopic Imager (spacecraft)
RXTE  Rossi X-Ray Timing Explorer (spacecraft)
SDSS  Sloan Digital Sky Survey (ground-based telescope)
SECCHI  Sun Earth Connection Coronal and Heliospheric Investigation (on STEREO)
SEP  Solar Energetic Particle events
SGR  Soft Gamma Repeaters
SMM  Solar Maximum Mission (spacecraft)
SO  Self-Organization
SOC  Self-Organized Criticality
SOHO  SOlar and Heliospheric Observatory (spacecraft)
SSC  Sudden Storm Commencement (magnetospheric events)
SSW  Solar SoftWare (software package in IDL)
STEREO  Solar TERrestrial RELations Observatory (spacecraft)
SuperDARN  Super Dual Auroral Radar Network
SWAVES  STEREO/WAVES instrument (on STEREO spacecraft)
Swift  spacecraft to observe gamma-ray bursts (NASA)
SXR  Soft X-Rays
SXT  Soft X-ray Telescope (on Yohkoh)
TRACE  Transition Region And Coronal Explorer (spacecraft)
UCB  University of California, Berkeley
Ulysses  interplanetary spacecraft
UV  ultraviolet
UVI  UltraViolet Imager (onboard POLAR spacecraft)
Voyager  Voyager 1 and 2 (interplanetary spacecraft)
<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Definition</th>
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<tbody>
<tr>
<td>WATCH</td>
<td>Wide Angle Telescope for Cosmic Hard X-Rays (on GRANAT)</td>
</tr>
<tr>
<td>WHAM</td>
<td>Wisconsin Hα Mapper (ground-based telescope)</td>
</tr>
<tr>
<td>WIC</td>
<td>Wideband Imaging Camera (a FUV instrument on IMAGE)</td>
</tr>
<tr>
<td>WIND</td>
<td>interplanetary spacecraft</td>
</tr>
<tr>
<td>WTD</td>
<td>Waiting Time Distribution</td>
</tr>
<tr>
<td>XEST</td>
<td>XMM Extended Survey of the Taurus Molecular Cloud</td>
</tr>
<tr>
<td>XMM</td>
<td>X-ray Multi-Mirror Mission (spacecraft), also called Newton</td>
</tr>
<tr>
<td>XUV</td>
<td>eXtreme UltraViolet</td>
</tr>
</tbody>
</table>
Fig. 1.1a: http://members.virtualtourist.com/m/5f4b4/, Water-storage dam at Yaotsu, Gifu, Japan.
Fig. 1.1b: http://www.wholey.net/HST/HST.html, A large wet snow avalanche at Deadman Canyon (Jim and Louise Wholey).
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Fig. 10.2b: http://www.freemars.org/jeff/planets/Jupiter.jpg, Jupiter photographed by NASA’s Voyager 2 mission, posted by Jeff Root at website of the Minnesota Space Frontier Society.


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