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# Lunar Impact Chronology



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*\*Zanetti, Williams, Ostrach, Spudis, Haruyama, Morota...*

*Please let us know if you are interested in contributing to this chapter!*

# Chapter Outline

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- Introduction (Definitions, Applications, Implications, etc.)
- Historic perspective
  - Early work (Öpik, Baldwin, Shoemaker, et al.)
  - Types of representing CSFDs (R-plot, cumulative, etc.): advantages/disadvantages
- Updates on Production Function
  - Determination of production function
  - Accurate shape of production function (power law vs. polynomial)
- Updates on Chronology Function
  - Selection of most representative count area
  - Selection of most representative sample ages
  - Peak in radiometric ages vs. youngest age
  - Ages of Copernicus, Tycho, North Ray, Cone
  - Unconstrained for ages between 0.8 and 3.2 Ga and >3.9 Ga
  - Accurate shape of chronology function (valid time range, CFs of various authors)
  - Recent impact rate
- Error discussion
  - Samples and CSFDs

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- Recent advancements on crater size-frequency distribution measurements
  - Image data base (too low/too high sun angle, spatial resolution)
  - Definition of count area (size, heterogeneities in albedo, color, morphology, topography, geology, etc.)
  - What is a crater? Effects of topography, degradation (e.g., Vesta)
  - Consistent counts across wide diameter range
  - Effects of secondaries/self-secondaries
  - Effects of target properties
  - Effects of non-random impact flux
  - Equilibrium
  - Accurate shape of production function (power law vs. polynomial)
  - Global catalogues
- Recent results from dating the lunar surface
  - Mare basalts (e.g., Crisium, Fecunditatis, Orientale, nearside/farside)
  - Light plains (e.g., Orientale, southern hemisphere)
  - Mare and highland domes (e.g., Marius Hills, Compton-Belkovich, Gruithuisen, etc.)
  - Pyroclastic deposits (e.g., Ap17)
  - Basins and craters (e.g., SPA, Crisium, King, Jackson etc.)
  - Tectonic features (e.g., lobate scarps etc.)

# Chapter Outline

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- Application to other planetary bodies
  - Planets
  - Asteroids
- Outlook and future work
  - New calibration points (from areas with well understood geologic context)
- Conclusions