



# Cosmochemistry

*By Harry Y. McSween Jr Jr, Gary R. Huss*

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How did the Solar System's chemical composition evolve? This textbook provides the answers in the first interdisciplinary introduction to cosmochemistry. It makes this exciting and evolving field accessible to undergraduate and graduate students from a range of backgrounds, including geology, chemistry, astronomy and physics. The authors - two established leaders who have pioneered developments in the field - provide a complete background to cosmochemical processes and discoveries, enabling students outside geochemistry to understand and explore the Solar System's composition. Topics covered include: - synthesis of nuclides in stars - partitioning of elements between solids, liquids and gas in the solar nebula - overviews of the chemistry of extraterrestrial materials - isotopic tools used to investigate processes such as planet accretion and element fractionation - chronology of the early Solar System - geochemical exploration of planets Boxes provide basic definitions and mini-courses in mineralogy, organic chemistry, and other essential background information for students. Review questions and additional reading for each chapter encourage students to explore cosmochemistry further.

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## Editorial Review

### Review

"A comprehensive treatment of the field of Cosmochemistry has been lacking and is long overdue. Hap McSween and Gary Huss have written a thorough and thoroughly enjoyable book that fills this gap. A really comprehensive, highly readable and overall first rate book. I highly recommend it to any scientist with interests in the chemistry and origins of solar systems. There is no doubt that I will adopt it for my own graduate course." Scott M. McLennan, Professor of Geochemistry, State University of New York, Stony Brook

"This new book by Hap McSween and Gary Huss, two highly acclaimed scientists in the field, takes on the difficult task of making the observations and core concepts of cosmochemistry clearly understandable to a non-specialized audience. The scope is broad, the pace pleasant, so this book will certainly be a very useful reference for introductory classes on the origin of the Solar System." Professor Francis Albarède, Ecole Normale Supérieure de Lyon

"This textbook provides a comprehensive overview of the modern field of cosmochemistry. A diverse range of topics ... are covered in a logical and coherent manner. ... This book should be considered indispensable for any student in the Earth and Planetary Sciences. It also serves as an essential reference for any researcher interested in planetary materials and the origins of planetary systems." Professor Dante S. Lauretta, Lunar and Planetary Laboratory, University of Arizona, Tucson

"The production is clean and economical, and the editing is first rate. Valuable as a textbook or supplement to the study of how the material universe came to be. **Summing Up:** Highly recommended." T.R Blackburn, formerly, American Chemical Society

"To introduce a discipline so complex and diversified as cosmochemistry to a wide audience is rather difficult. The authors have succeeded in writing a comprehensive book on this matter that has turned out to be very attractive to read. I and some of my students were amazed at the direct style used to explain even extremely complex facts. Definitely, a compilation like this is useful not only to undergraduate and graduate students but also to researchers from related fields." Meteoritics & Planetary Science

"The production is clean and economical, and the editing is first rate. Valuable as a textbook or supplement to the study of how the material universe came to be. ...Highly recommended." CHOICE

"... the authors present a comprehensive overview of all aspects of modern cosmochemistry, including its historical aspects...Writing such a book has been seen as a difficult task by many scientists and accordingly, the positive outcome has been praised especially for being comprehensive yet coherent and accessible. The quality of the print, the paper and the book as a whole is excellent. This book must be recommended particularly to undergraduate and graduate students in the fields related to cosmochemistry. It is, however, also a fascinating read for experts in the field, especially due to the presentation of historical aspects." - Manuel Vogel, Contemporary Physics, August 2011

### About the Author

Harry (Hap) McSween is Chancellor's Professor at the University of Tennessee. He has conducted research on cosmochemistry for more than three decades and was one of the original proponents of the hypothesis that some meteorites are from Mars. He has been a co-investigator for four NASA spacecraft missions and serves

on numerous advisory committees for NASA and the US National Research Council. Dr McSween has written or edited four books on meteorites and planetary science, and co-authored a textbook in geochemistry. He is a former President and Fellow of the Meteoritical Society, a Fellow of the American Academy of Arts and Sciences, recipient of the Leonard Medal, and has an asteroid named for him.

Gary Huss is a Research Professor and Director of the W. M. Keck Cosmochemistry Laboratory at the Hawaii Institute for Geophysics and Planetology, University of Hawaii at Manoa. In more than three decades of research on cosmochemistry, he was among the first to study presolar grains, the raw materials for the Solar System. He presently studies the chronology of the early Solar System. He comes from a family of meteorite scientists: his grandfather, H. H. Nininger, has been called the father of modern meteoritics, and his father, Glenn Huss, and grandfather were responsible for recovering over 500 meteorites previously unknown to science. Dr Huss is a former President and Fellow of the Meteoritical Society and also has an asteroid named for him.

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