

## Annual Review of Astronomy and Astrophysics

[astro.annualreviews.org](http://astro.annualreviews.org) • Volume 56 • September 2018 • ISSN: 0066-4146 • ISBN: 978-0-8243-1947-2

**AAS Member Discounted Price: \$78.40 (WORLDWIDE)** Regular price: \$112.00

Co-Editors: **S. M. Faber**, *University of California, Santa Cruz*

**Ewine F. van Dishoeck**, *Leiden Observatory, Leiden University and Max-Planck Institute for Extraterrestrial Physics, Garching*



### TABLE OF CONTENTS AND AUTHORS:

- *Cosmology Paradigm Changes*, Jaan Einasto
- *High-Mass Star and Massive Cluster Formation in the Milky Way*, Frédérique Motte, Sylvain Bontemps, Fabien Louvet
- *Multiple Stellar Populations in Globular Clusters*, Nate Bastian, Carmela Lardo
- *Dynamical Evolution of the Early Solar System*, David Nesvorný
- *Origins of Hot Jupiters*, Rebekah I. Dawson, John Asher Johnson
- *Chemodynamical History of the Galactic Bulge*, Beatriz Barbuy, Cristina Chiappini, Ortwin Gerhard
- *Multiconjugate Adaptive Optics for Astronomy*, François Rigaut, Benoît Neichel
- *Extreme Adaptive Optics*, Olivier Guyon
- *The Pluto System After New Horizons*, S. Alan Stern, William M. Grundy, William B. McKinnon, Harold A. Weaver, Leslie A. Young
- *Weak Lensing for Precision Cosmology*, Rachel Mandelbaum
- *The Connection Between Galaxies and Their Dark Matter Halos*, Risa H. Wechsler, Jeremy L. Tinker
- *Atomic and Ionized Microstructures in the Diffuse Interstellar Medium*, Snežana Stanimirović, Ellen G. Zweibel
- *Debris Disks: Structure, Composition, and Variability*, A. Meredith Hughes, Gaspard Duchêne, Brenda C. Matthews
- *Rubble Pile Asteroids*, Kevin J. Walsh
- *Obscured Active Galactic Nuclei*, Ryan C. Hickox, David M. Alexander
- *The Interstellar Dust Properties of Nearby Galaxies*, Frédéric Galliano, Maud Galametz, Anthony P. Jones

## Annual Review of Earth and Planetary Sciences

[earth.annualreviews.org](http://earth.annualreviews.org) • Volume 46 • May 2018 • ISSN: 0084-6597 • ISBN: 978-0-8243-2046-1

**AAS Member Discounted Price: \$78.40 (WORLDWIDE)** Regular price: \$112.00

Co-Editors: **Katherine H. Freeman**, *Pennsylvania State University*

**Raymond Jeanloz**, *University of California, Berkeley*



### TABLE OF CONTENTS AND AUTHORS:

- *A Geologist Reflects on a Long Career*, Dan McKenzie
- *Low-Temperature Alteration of the Seafloor: Impacts on Ocean Chemistry*, Laurence A. Coogan, Kathryn M. Gillis
- *The Thermal Conductivity of Earth's Core: A Key Geophysical Parameter's Constraints and Uncertainties*, Q. Williams
- *Fluids of the Lower Crust: Deep Is Different*, Craig E. Manning
- *Commercial Satellite Imagery Analysis for Countering Nuclear Proliferation*, David Albright, Sarah Burkhard, Allison Lach
- *Controls on O<sub>2</sub> Production in Cyanobacterial Mats and Implications for Earth's Oxygenation*, Gregory J. Dick, Sharon L. Grim, Judith M. Klatt
- *Induced Seismicity*, Katie M. Keranen, Matthew Weingarten
- *Superrotation on Venus, on Titan, and Elsewhere*, Peter L. Read, Sebastien Lebonnois
- *The Origin and Evolutionary Biology of Pinnipeds: Seals, Sea Lions, and Walruses*, Annalisa Berta, Morgan Churchill, Robert W. Boessenecker
- *Paleobiology of Pleistocene Proboscideans*, Daniel C. Fisher
- *Subduction Orogeny and the Late Cenozoic Evolution of the Mediterranean Arcs*, Leigh Royden, Claudio Faccenna
- *The Tasmanides: Phanerozoic Tectonic Evolution of Eastern Australia*, Gideon Rosenbaum
- *Atlantic-Pacific Asymmetry in Deep Water Formation*, David Ferreira, Paola Cessi, Helen K. Coxall, Agatha de Boer, Henk A. Dijkstra, Sybren S. Drijfhout, Tor Eldevik, Nili Harnik, Jerry F. McManus, David P. Marshall, Johan Nilsson, Fabien Roquet, Tapio Schneider, Robert C. Wills
- *The Athabasca Granulite Terrane and Evidence for Dynamic Behavior of Lower Continental Crust*, Gregory Dumond, Michael L. Williams, Sean P. Regan
- *Physics of Earthquake Disaster: From Crustal Rupture to Building Collapse*, Koji Uenishi
- *Time Not Our Time: Physical Controls on the Preservation and Measurement of Geologic Time*, Chris Paola, Vamsi Ganti, David Mohrig, Anthony C. Runkel, Kyle M. Straub
- *The Tectonics of the Altaids: Crustal Growth During the Construction of the Continental Lithosphere of Central Asia Between ~750 and ~130 Ma Ago*, A.M. Celâl Şengör, Boris A. Natal'in, Gürsel Sunal, Rob van der Voo
- *The Evolution and Fossil History of Sensory Perception in Amniote Vertebrates*, Johannes Müller, Constanze Bickelmann, Gabriela Sobral
- *Role of Soil Erosion in Biogeochemical Cycling of Essential Elements: Carbon, Nitrogen, and Phosphorus*, Asmeret Asefaw Berhe, Rebecca T. Barnes, Johan Six, Erika Marín-Spiotta
- *Responses of the Tropical Atmospheric Circulation to Climate Change and Connection to the Hydrological Cycle*, Jian Ma, Robin Chadwick, Kyong-Hwan Seo, Changming Dong, Gang Huang, Gregory R. Foltz, Jonathan H. Jiang

# ANNUAL REVIEWS 2018 PERSONAL COPY ORDER FORM • AAS Members

Prepayment required | Order by phone, fax, or mail using this form or place your order online at [www.annualreviews.org](http://www.annualreviews.org).  
Your personal subscription includes permanent data rights to that volume's full-text online content.

Please mention priority code **AAS** when placing your order.

SHIPPING		
SHIPPING ADDRESS ALL FIELDS REQUIRED. PLEASE PRINT CLEARLY		
Today's Date:	Email:	
Name:		
Institution:		
Address:		
City:	State:	Postal Code / Zip:
Country:		
Day Phone: ( )	Fax: ( )	

BILLING		
PAYMENT METHOD (PLEASE CHECK ONE):		
<input type="radio"/> Check/Money Order (PAYABLE TO ANNUAL REVIEWS DRAWN ON A US BANK IN US DOLLARS)		
<input type="radio"/> Charge: <input type="radio"/> VISA <input type="radio"/> MasterCard <input type="radio"/> AMEX	Account No.:	Expiration Date (Mo/Yr):
First Name:	Last Name:	Signature:
PRINT NAME EXACTLY AS IT APPEARS ON CREDIT CARD		
CREDIT CARD BILLING ADDRESS REQUIRED	<input type="radio"/> Same as Shipping Address	
Name:		
Address:		
City:	State:	Postal Code / Zip:
Country:		

JOURNAL ORDER			
Qty	Journal	AAS Discounted Price	Total
	<b>Annual Review of Astronomy and Astrophysics, Volume 56</b> Personal Subscription	\$78.40	
	<b>Annual Review of Earth and Planetary Sciences, Volume 46</b> Personal Subscription	\$78.40	
USA and Canadian Customers: Applicable Sales, GST, HST Taxes will be calculated based on ship-to address.			
Handling charges • Add \$6 per volume • Applies to all orders • Max \$18.00 per ship-to location			
SUBTOTAL			
Standard shipping • US Mail special 4th class (surface), no extra charge			N/C
Expedited shipping is available. Contact Customer Service for cost.			
TOTAL			

FOR MORE INFORMATION ON TAXES, FEES, AND SHIPPING POLICY, PLEASE SEE: <http://www.annualreviews.org/page/subscriptions/general-information>

SEND PERSONAL COPY VOLUME ORDERS TO (New Credit Card customers, please call Customer Service before placing your order):

CREDIT CARD PAYMENTS:  
Annual Reviews  
P.O. Box 10139  
Palo Alto, CA 94303-0139 USA  
Tel: 800.523.8635 (Toll Free USA/Canada)  
650.493.4400 Fax: 888.355.0123 (Worldwide)  
Email: [service@annualreviews.org](mailto:service@annualreviews.org)

CHECK PAYMENTS:  
Annual Reviews  
Dept. 33729  
P.O. Box 39000  
San Francisco, CA 94139 USA  
Email: [service@annualreviews.org](mailto:service@annualreviews.org)

## ANNUAL REVIEWS: Connect With Our Experts

4139 El Camino Way, P.O. Box 10139 | Palo Alto, CA 94303-0139 USA  
Call Toll Free (USA/Canada): 800.523.8635 or 650.493.4400 | Fax: 650.424.0910 | Email: [service@annualreviews.org](mailto:service@annualreviews.org) | [www.annualreviews.org](http://www.annualreviews.org)