

Dr. Victor R. Baker

GSA Distinguished International Lecturer 2012



Dr. Baker Short Biography :

Victor R. Baker is Regents' Professor of Hydrology and Water Resources, Geosciences, and Planetary Sciences, University of Arizona. He received a B.S. in Geology from Rensselaer Polytechnic Institute in 1967 and a Ph.D. in Geology from the University of Colorado in 1971. He has authored or co-authored more than 360 research articles and 16 books on topics that include paleoflood hydrology; flood geomorphology; channels, valleys, and geomorphic features on Mars and Venus; catastrophic Pleistocene floods in the northwestern U.S. and central Asia; history/philosophy of Earth and planetary sciences; and the interface of environmental science with public policy. Professor Baker has been President of the Geological Society of America (1998), Chair of the American Association for the Advancement of Science Section on Geology and Geography (1992-93 and 2008-2009), and President of the International Union for Quaternary Research Commission on Global Continental Paleohydrology (1995-99). Among his honors are Foreign Membership

in the Polish Academy of Sciences (1994); Honorary Fellowship in the European Union of Geosciences (1999); the David Linton Award of the British Society for Geomorphology (1995); the Distinguished Scientist Award (2002) and Distinguished Career Award (2010), both from The Geological Society of America Quaternary Geology and Geomorphology Division; a Fulbright-Hays Senior Research Fellowship; an Indo-American Fellowship; and professional society Fellowships respectively in the American Geophysical Union, the American Association for the Advancement of Science, and The Geological Society of America. His work on megafloods has been featured on multiple television documentaries for PBS, BBC, and the National Geographic, Discovery and History Channels, including the 2005 NOVA production "Mystery of the Megaflood."

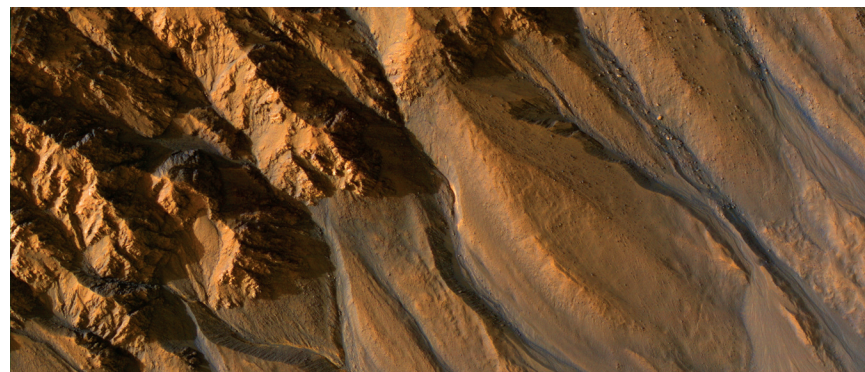
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Lecture Topic—Megafloods on Earth, Mars, and Beyond

For more than 40 years University of Arizona Regents' Professor Victor R. Baker has been studying the most spectacular and immense flood phenomena that are currently known to occur anywhere in the solar system. The immense megafloods of the last Ice Age created bizarre landscapes like the Channeled Scabland and altered the circulation of the oceans thereby changing Earth's climate. More surprising was the discovery that much larger megafloods occurred billions of years ago on the planet Mars. The Martian megafloods formed temporary bodies of water on that planet, even generating a kind of ocean that facilitated environmental conditions on Mars that may have been like those of an ice age on Earth. These discoveries are showing that Mars, like Earth, had a long-term cycle of water circulation that produced a habitable planet, and these are exactly the kinds of processes to seek out in the newly initiated search for the other habitable planets of the universe.

Lecture Topic—Geological History of Water on an Earth-like Planet

Recent advances in astronomy hold the prospect for discovery of a great many Earth-like planets, rich in both water and possible habitats for life, thereby greatly expanding from the current sample of one. Nevertheless, until it proves possible to do geology for these numerous potential exo-Earths, we can greatly advance the geological science of Earth-like planets by study of Mars. The early geological histories of both Mars and Earth are closely tied to the role of water, extending from the nature of planetary accretion to the origin of a physically coupled atmosphere and ocean, the prospects for initiating plate tectonics, and historical records of punctuated greenhouse-to-icehouse climatic transitions. Recent discoveries from Mars missions reveal the extensive role of water in generating sedimentary rocks, active and relict glacial and periglacial features, aqueous weathering products (clay minerals and sulfates), alluvial fans and deltas, the extensive development of paleolakes, and even a probable, though transient ocean.



Gullies with Characteristics of Water-Carved Channels. False-color image of gully channels in a crater in the southern highlands of Mars, taken by the High Resolution Imaging Science Experiment (HiRISE) camera on the Mars Reconnaissance Orbiter. The gullies emanating from the rocky cliffs near the crater's rim (upper left) show meandering and braided patterns typical of water-carved channels. North is approximately up and illumination is from the left. Credit: NASA/JPL/University of Arizona.