

## Preface

In a cosmic sense, the collision of the ninth periodic comet discovered by the team of Carolyn and Gene Shoemaker and David Levy with the planet Jupiter was unremarkable. The history of the solar system, indeed its very genesis, has been marked by countless such events. The cratered surfaces of planetary bodies are a testament to this ubiquitous phenomenon; even the Earth's ephemeral surface records the continued action of this elemental process in impact craters and in the fossil record.

In human terms, on the other hand, the impact of Comet Shoemaker-Levy 9's 20-odd fragments into Jupiter was an unprecedented event of global significance. After a year of planning and preparation, the largest astronomical armada in history focussed on the planet Jupiter in July 1994. News of each successively more astonishing image or spectrum was broadcast with almost instantaneous speed over the world's increasingly sophisticated computer communications network. Astronomers were, for a time, to be found on daily newscasts and the front pages of newspapers. For a week in July, the world looked up from its normal preoccupations long enough to notice, and to ponder, the awesome beauty of the natural world and the surprising unpredictability of the universe.

Still one more perspective on this event remains. What has science gained from the terabytes of images, lightcurves and spectra obtained over the entire range of the electromagnetic spectrum? Do we now have a better understanding of comets, of the atmosphere of Jupiter, of the effect of high-velocity impacts on planetary atmospheres? What has been deduced about SL9's size, composition, or structure? Do we fully understand the sequence of events recorded in our data?

The Hubble Space Telescope played a central role in the initial characterization of SL9 and in recording unique images and spectra of the impacts and impact sites during the week of July 14–21, 1994. It is fitting that a meeting conceived as a first attempt to synthesize answers to the above, and many more, questions was held as part of the STScI May symposium series (and under the auspices of the International Astronomical Union as Colloquium 156). The meeting held in Baltimore in May 1995 at the Space Telescope Science Institute and the Johns Hopkins University attracted more than 200 scientists who heard 16 invited reviews, participated in 9 workshops, and discussed over 140 contributed posters. Some questions were answered, and new ones raised.

This volume is composed of sixteen chapters from the invited speakers on the topics reviewed at the meeting. Most chapters have been updated to include the latest results presented at the 1995 Division of Planetary Sciences Meeting. Two of the chapters have authors who did not give the review talk at the meeting and one, the first chapter, is written by the chairs of one of the workshops. The result is the first comprehensive synthesis of the SL9 event covering everything from its prehistory to the dissipation of the debris clouds. Though the first, this will probably not be the last volume to review this significant event. We hope that this volume will provide the starting point for future reviewers who will report on the deepening of our understanding of this example of one of the universe's fundamental processes.

Special thanks are due to a large number of people who helped support the symposium. Foremost, we thank the scientists at the Space Telescope Science Institute who were willing to commit the resources of our large annual meeting to this topic well *before* July 1994 when the dramatic results of the impacts were not imagined. The Johns Hopkins University gracefully provided its facilities for this large meeting and also added financial support. Dr. Michael A'Hearn led the science organizing committee and was instrumental in garnering the support of the IAU. Dr. Alex Storrs performed excellent service as head of the local organizing committee, along with many others. Cheryl Schmidt made the

organization of this largest May symposium yet look easy with her usual skill. Finally, Sharon Toolan cheerfully and skillfully turned a collection of manuscripts into a beautiful and coherent volume.

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