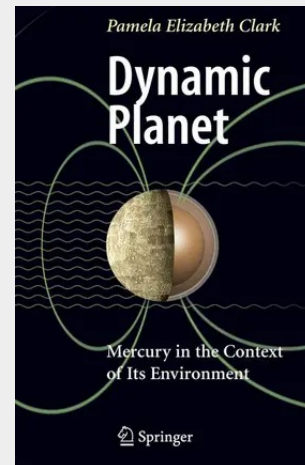


Dynamic Planet

Mercury in the Context of its Environment

UNDERSTANDING THE PLANET MERCURY Thirty years have elapsed since the one and only mission to Mercury, Mariner 10, performed three flybys of the planet, capturing moderate-resolution (100 m at best) images of one hemisphere (45% of the surface) and discovering that Mercury could be the only other terrestrial planet to have a global magnetic field and core dynamo analogous to the Earth's. At the time of this writing, the MESSENGER mission to Mercury has been launched. We are still a couple of years away from the first of the next flybys of Mercury, by MESSENGER, on its way to insertion into a nearly polar, but highly elliptical, orbit, seven years from launch. In the interim, a plethora of ground-based observations has been providing information on hitherto unseen aspects of Mercury's surface and exosphere. Furthermore, Mariner 10 data have been analyzed and reanalyzed as the technology for modeling and image processing has improved, leading to important breakthroughs in our understanding of Mercury and its environment. Thus, we are writing this book with the realization that we are in a time of transition in our understanding of the planet Mercury. Of particular interest to us in this book is the emerging picture of Mercury as a very dynamic system, with interactions between interior, surface, exosphere, and magnetosphere that have influenced and constrained the evolution of each part of the system.

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