mathematical theory of entrainment in cumulus clouds and became the first woman to earn a doctorate in meteorology from a US university.

Simpson's research took off, literally, at the Woods Hole Oceanographic Institution during the 1950s. Supported by the Office of Naval Research and later the National Hurricane Research Project, she began to fly on heavily instrumented aircraft through tropical clouds. The observations led her and Riehl to develop the concept of "hot towers," or giant complexes of cumulonimbus clouds that provide the energy to power hurricanes and drive the tropical atmosphere.

Simpson's studies of cloud dynamics and hurricanes led to her involvement with weather control experiments during the 1960s. Resigning from a full professorship at UCLA that she had held for only three years, Simpson went to work for the bureaucracy that would soon become NOAA. She and Bob eventually became leaders in Project Stormfury, a substantial effort by the US Weather Bureau (now the National Weather Service) and the US Navy to understand hurricanes and attempt to control them with cloud seeding. While that put them at the center of hurricane research, their desire to understand the storms meshed uncomfortably with the navy's aspiration to control them for military advantage.

A much happier research environment came when Simpson became head of the Severe Storms Branch at NASA's Goddard Space Flight Center in 1979. There she improved cloud models and mentored young researchers. Her signature achievement was serving as project scientist for the *Tropical Rainfall Measuring Mission*, a satellite that provided crucial data to understand climate change.

Because *First Woman* is primarily based on Simpson's remarkable collection of personal papers, which are held at Harvard University's Radcliffe Institute for Advanced Study, she is the author of many of the words in the book. Fleming quotes at length from her personal journals, which contain intimate details about her scientific work and marital issues. He argues that Simpson chose not to place any restrictions on those diaries because of "her desire to be understood beyond her professional résumé."

Fleming also uses two oral history interviews: one conducted by Simpson's scientific colleague Margaret LeMone in 1989 and the other done by Kristine Harper, a historian of science, in 2000. The latter contains descriptions of what would now be recognized as extensive sexual harassment. For example, Simpson recalled that Riehl "tried to make a pass whenever he could, but I managed to resist just enough to keep him interested. And oh, we got to be really good friends and colleagues."

Fleming uses biography to illuminate the broader history of tropical meteorology. Simpson's career stretched from World War II into the 2000s, and her story sheds light on a field that Fleming argues has been neglected by historians in comparison to polar and temperate-latitude meteorology.

One inevitable cost to writing a concise book tightly focused on Simpson is that Fleming doesn't compare her with peers, such as the radar meteorologist Pauline Morrow Austin and the atmospheric physicist Florence van Straten, who also had successful research careers. But neither woman was as celebrated as Simpson nor had her life as well documented. The continuing work of understanding women's contributions to atmospheric science will certainly build on Fleming's scholarship.

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ANNE PYNE COWLEY (left) and **JOCELYN BELL BURNELL** (right) pictured at American Astronomical Society meetings in 1972 and 1987, respectively.

A survey of women in astronomy

"Women hold up half the sky and some day it will be so in astronomy!" So opens *The Sky Is for Everyone: Women Astronomers in Their Own Words*, a new book coedited by Virginia Trimble and David Weintraub. It's an odd sentence with which to open a book about women in astronomy, in large part because it is adapted from a quotation by

The Sky Is for Everyone
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Virginia Trimble and David A. Weintraub, eds.
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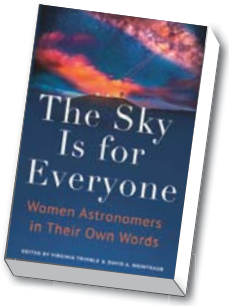

Mao Zedong. (Were there really no appropriate quotations available from female astronomers or others who were not responsible for the Cultural Revolution?) Nevertheless, in that opening quotation, Trimble and Weintraub set out the agenda for their book: to demonstrate the significant contributions women have made, and continue to make, in astronomy and to further the inclusion and appreciation of women in the profession.

For most readers, like myself, Trimble and Weintraub are probably preaching to the choir. Sadly, those who remain unconvinced as to the merits of women in astronomy are unlikely to pick up a book like *The Sky Is for Everyone* with an open mind. Fortunately, however, that group is in the minority in comparison with those who will find its contents interesting, informative, and motivating.

The book begins with a historical digression that surveys women in astronomy with an emphasis on individuals from the US and Europe (primarily the UK). It leads into a who's who of early PhDs and other biographical sketches. Although that chapter does not add anything new to the historical literature, it is a useful survey of the history of women in astronomy, especially during the 19th and 20th centuries. The editors emphasize how many early women astronomers depended on a male mentor, husband, or family member to gain access to the profession and its networks. Although that is certainly not as true as it once was, it is still the case that female astronomers can be constrained by the infrastructures within which they work and that a supportive network can make or break a career, as the book's subsequent chapters illustrate.

The majority of *The Sky Is for Everyone* is a compilation of 37 autobiographical chapters by prominent female astronomers at a range of career stages. The chapters are ordered chronologically by the year in which the individual's PhD was awarded. The earliest ones primarily showcase accounts of white women from the US and UK, such as Anne Pyne Cowley and Jocelyn Bell Burnell, who received their PhDs in the 1960s. But as the book progresses, it features a more diverse subset of authors, including Gabriela González, Dara Norman, and Shazrene Mohamed.

Each author tells her story in her own way. Some authors go into great depth about their childhoods; others, about complicated career journeys. The degree to which each author focuses on her social and cultural surroundings also varies considerably, although all of them detail what they are most passionate about: the science. In some respects the book is a communal love letter to astronomy and the broader sciences that have inspired those women to look to the stars.

Unfortunately, as could be predicted given the identities of the authors, the course of that love has often not run smoothly. Multiple authors chronicle their experiences of personal and institutional sexism, and some describe stories of racism and xenophobia as well. Because the chapters are chronologically ordered, institutional barriers gradually but definitively drop away as the book progresses, although instances of harassment, microaggressions, and toxic academic culture remain present today. The biographies feature plenty of infuriating moments and plenty of moments that will make the reader sigh but also plenty of triumphs.

The Sky Is for Everyone is a valuable read for astronomers and those interested in the status of women in science, but also for department heads and policymakers who should take note of how institutional barriers can be broken down and accommodations made to improve the astronomy community. It may also prove inspiring and useful to early-career scientists: Although the book focuses primarily on highly successful astronomers at elite universities, it illustrates a multiplicity of possible career paths.

Finally, historians of astronomy will enjoy the book not only because it sheds light on the recent history of women in the field but also because it simultaneously serves as a history of 20th-century astronomy, with a focus on the growth of observatories, the increasing size of scientific collaborations, and the increased emphasis placed by national and international scientific societies on public outreach and institutional equity.

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