

Introduction to the Chinese–American Frontiers of Science

Since 1989, the National Academy of Sciences (NAS) has organized annual symposia entitled Frontiers of Science. The goal of these symposia is to bring together some of the very best young scientists to discuss exciting advances and opportunities in their fields in a format that encourages informal discussions among participants, both in groups and one-on-one. Speakers present their talks on cutting-edge research in their disciplines to colleagues outside of their fields and address questions such as: “What are the major research problems and distinctive tools of your field?” “What are the current limitations in advancing your field?” and “How might insight derived from other fields contribute to overcoming these limitations?” The process of formulating and answering such questions involves surmounting the barriers imposed by the specialized terminologies and techniques that characterize different branches of science. This process poses formidable challenges that these symposia are addressing with success.

The U.S. Frontiers symposium series has spawned similar programs, including the Chinese–American Frontiers of Science symposium, which was organized in cooperation with the Chinese Academy of Sciences.

These symposia are attended by approximately 80 scholars under 45 years of age (half from the U.S. and half from China), by a dozen senior colleagues, and by several science writers. At the symposium, some 25 young scientists report on current research within their disciplines to an academically trained and scientifically diverse audience. They highlight major research

challenges, methodologies, and limitations to progress at the frontiers of their respective fields. All attendees participate actively in a general discussion period, during which they learn from and form collaborative relationships with other young scientists in different fields.

Frontiers of Science symposia are also organized with Germany and Japan. Thus, the Frontiers of Science symposia have become a major instrument in bringing together the best young researchers (the next generation of leaders) in the natural sciences and engineering in the United States, and, increasingly, in other countries.

The *Proceedings of the National Academy of Sciences* (PNAS) publishes collected summaries of the talks presented at these symposia, as part of the “From the Academy” series that is designed to inform PNAS readers about the workings of the National Academy of Sciences. Summaries of presentations from the 1990 U.S. symposium (1), and the 1991 and 1992 U.S. symposia (2) have been published by the National Academy Press. Starting with the 1995 U.S. Frontiers of Science symposium (3–7), these collected summaries, including the German–American Frontiers of Science (8–11), the Japanese–American Frontiers of Science (12, 13), and the Chinese–American Frontiers of Science (14, 15) have been published in PNAS. The following papers summarize sessions of the third Chinese–American Frontiers of Science symposium held October 20–22, 2000, at the Arnold and Mabel Beckman Center of the National Academies of Science and Engineering in Irvine, CA.

1. Greenwood, A., ed. (1989) *Science at the Frontier* (Natl. Acad. Sci./Natl. Acad. Press, Washington, DC).
2. Bartusiak, M. F., Burke, B., Chaikin, A., Greenwood, A., Heppenheimer, T. A., Hoffman, M., Holzman, D., Maggio, E. J. & Moffat, A. S., eds. (1994) *A Positron Named Priscilla: Scientific Discovery at the Frontier* (Natl. Acad. Sci./Natl. Acad. Press, Washington, DC).
3. Seventh Annual Symposium on Frontiers of Science (1997) *Proc. Natl. Acad. Sci. USA* **94**, 6579–6590.
4. Eighth Annual Symposium on Frontiers of Science (1997) *Proc. Natl. Acad. Sci. USA* **94**, 2773–2795.
5. Ninth Annual Symposium on Frontiers of Science (1998) *Proc. Natl. Acad. Sci. USA* **95**, 11027–11042.
6. Tenth Annual Symposium on Frontiers of Science (1999) *Proc. Natl. Acad. Sci. USA* **96**, 9982–9996.
7. Eleventh Annual Symposium on Frontiers of Science (2000) *Proc. Natl. Acad. Sci. USA* **97**, 12956–12964. (First published October 31, 2000, in PNAS Early Edition)
8. Third Annual Symposium on German–American Frontiers of Science (1997) *Proc. Natl. Acad. Sci. USA* **94**, 12733–12750.
9. Fourth Annual Symposium on German–American Frontiers of Science (1999) *Proc. Natl. Acad. Sci. USA* **96**, 8327–8337.
10. Fifth Annual Symposium on German–American Frontiers of Science (1999) *Proc. Natl. Acad. Sci. USA* **96**, 14196–14209.
11. Sixth Annual Symposium on German–American Frontiers of Science (2001) *Proc. Natl. Acad. Sci. USA* **98**, 10524–10532.
12. First Symposium on Japanese–American Frontiers of Science (1999) *Proc. Natl. Acad. Sci. USA* **96**, 8818–8828.
13. Second Annual Symposium on Japanese–American Frontiers of Science (2000) *Proc. Natl. Acad. Sci. USA* **97**, 12402–12412. (First published October 17, 2000, in PNAS Early Edition)
14. First Symposium on Chinese–American Frontiers of Science (1999) *Proc. Natl. Acad. Sci. USA* **96**, 11062–11076.
15. Second Annual Symposium on Chinese–American Frontiers of Science (2000) *Proc. Natl. Acad. Sci. USA* **97**, 11140–11148.