

Bio: Joel R. Primack, Professor of Physics, University of California, Santa Cruz

Joel Primack is one of the world's leading cosmologists, specializing in the formation and evolution of galaxies and the nature of the dark matter that makes up at least 90 percent of all the matter in the universe. Dr. Primack received his A.B. from Princeton in 1966 and his Ph.D. from Stanford in 1970. He was then a Junior Fellow of the Society of Fellows of Harvard University. Since 1973, he has been on the faculty of the University of California, Santa Cruz. After helping to create what is now called the "Standard Model" of particle physics, Dr. Primack began working in cosmology in the late 1970s and he became a leader in the new field of particle astrophysics. Primack is one of the principal originators and developers of the theory of Cold Dark Matter, which has become the basis for the standard modern picture of structure formation in the universe. With support from the National Science Foundation, NASA, and the Department of Energy, he is currently using supercomputers to simulate and visualize the evolution of the universe under various assumptions, and comparing the predictions of these theories to the latest observational data. Primack was made a Fellow of the American Physical Society (APS) in 1988 "for pioneering contributions to gauge theory and cosmology." He was elected to the Executive Committee of the APS Division of Astrophysics 2001-2002. He has won awards for his research from the Sloan Foundation and the Alexander von Humboldt Foundation.

Dr. Primack's research in cosmology is described in most modern books on the subject, and he has been profiled at some length in several books including *New York Times* science writer Dennis Overbye's *Lonely Hearts of the Cosmos* and *Time* magazine science writer Michael Lemonick's *The Light at the Edge of the Universe*. Primack is also frequently interviewed by reporters for print and broadcast media. He was one of the main consultants for the Smithsonian Air and Space Museum's 1996 IMAX film *Cosmic Voyage*. In addition to more than 200 technical articles in professional journals, Primack has written a number of articles aimed at a popular audience. These include the articles on "gravitation," "matter," "dark matter," "dark energy," and other physics and astronomy topics in the *World Book Encyclopedia*, and articles in publications such as *Astronomy*, *Beam Line*, *California Wild*, *Sky and Telescope* and in the *McGraw-Hill Encyclopedia of Science* and the *Encyclopedia of Astronomy and Astrophysics*.

Primack shared the APS Forum on Physics and Society Award in 1977 with Frank von Hippel of Princeton for their book *Advice and Dissent: Scientists in the Political Arena* (Basic Books, 1974; New American Library, 1976). In 1995 Dr. Primack was made a Fellow of the American Association for the Advancement of Science (AAAS), "for pioneering efforts in the establishment of the AAAS Congressional Science Fellows Program and for dedication to expanding the use of science in policymaking throughout government." He has served on the board of the Federation of American Scientists and was a founder of the Union of Concerned Scientists. His most recent science policy work has been on efforts to protect the near-Earth space environment; his popular articles on this have appeared in *Science*, *Technology Review*, *Bulletin of the Atomic Scientists*, and *Scientific American*. He is currently a member of the APS Panel on Public Affairs. He has also served as an advisor to and participant in the Science and the Spiritual Quest project, and as chairman of the advisory committee for the AAAS Program of Dialogue on Science, Ethics, and Religion 2000-2002.

Primack's teaching and writing with his wife Nancy Abrams explores the broad implications of the ongoing revolution in cosmology. Their articles have appeared in books and magazines including *Astronomy Now*, *Philosophy in Science*, *Science*, *Science & Spirit*, *Spirituality and Health*, and *Tikkun*. Their course at UCSC on Cosmology and Culture has received awards from the Templeton Foundation and from the American Council of Learned Societies.