

## **Joel Primack - Scientific and Public Lectures**

- 2019** Comparing Galaxy Simulations and Observations with Artificial Intelligence, Astrophysics Seminar, UC Irvine, May 28
- Comparing Galaxy Simulations and Observations with Artificial Intelligence, Seminar, Carnegie Observatories, Pasadena, April 29
- Comparing Galaxy Simulations and Observations with Artificial Intelligence, Astrophysics Seminar, Harvard-Smithsonian Center for Astrophysics, March 6
- 2018** The Galaxy Density-Shape Evolutionary Sequence in VELA Simulations and Observations, Conference on the Co-Evolution of Galaxies and their Central Regions, Dali, Yunnan Province, China, Nov 8
- AGORA Galaxy Simulations Comparison, Santa Cruz Galaxy Workshop, August 8
- Artificial Intelligence for Astronomy, Googleplex, Mountain View, CA, August 1, with Marc Huertas-Company
- The Birth of Cold Dark Matter, Conference on Galaxy Scaling Relations and Dark Matter, Queens University, Kingston, Ontario, July 16
- New Insights on Galaxy Formation from Comparing Simulations and Observations, Canadian Institute for Theoretical Astrophysics, U Toronto, July 13
- New Insights on Galaxy Formation from Comparing Simulations and Observations, Seminar, Space Telescope Science Institute, June 15
- Computer Vision and Deep Learning Applied to Simulations and Imaging of Galaxies and the Evolving Universe, presented via the web at Conference on AI and Big Data in Science and Faith, Bar Ilan University, Israel, March 12
- Computer Vision and Deep Learning Applied to Simulations and Imaging of Galaxies and the Evolving Universe, Electronic Imaging Conference, Burlingame, CA, January 30
- The Structure of the Universe, Sid Drell Symposium, SLAC, January 12
- 2017** State of the Universe Report, Public Talk, *Nation* Cruise to Baja California, December 4
- Deep Learning for Galaxies (a Progress Report), Seminar, UC San Diego, December 1
- The Galaxy-Halo Connection, Physics-Astronomy Colloquium, UC San Diego, November 30
- Deep Learning for Galaxies, Santa Cruz Galaxy Workshop, August 11

The Evolving Galaxy-Halo Connection, CANDELS Workshop, UCSC, August 5

Structural Evolution in the Galaxy-Halo Connection, and Halo Properties as a Function of Environment Density and Web Location, Galaxy-Halo Connection Conference, KITP, July 7

New Insights on Galaxy Formation from Comparing Simulations and Observations, seminar at Google, Mountain View, CA, May 30  
slides: <http://physics.ucsc.edu/~joel/GoogleTalk-Primack-30May2017.pdf>  
video: <https://www.youtube.com/watch?v=bpTs2eLS07I>

Structural Evolution in the Galaxy-Halo Connection, and Halo Properties as a Function of Density and Web Environment, Galaxy-Halos conference, Kavli Institute for Theoretical Physics, UCSB, May 17  
Slides & Video: [http://online.kitp.ucsb.edu/online/galhalo\\_c17/primack/](http://online.kitp.ucsb.edu/online/galhalo_c17/primack/)

Constraining the Galaxy-Halo Connection: Star Formation Histories, Galaxy Mergers and Structural Properties, UCSC Cosmology Seminar, February 27. Slides: [GalaxyHaloConnectionPaper-Cosmoclub-27Feb2017.pdf](http://www.physics.ucsc.edu/~joel/GalaxyHaloConnectionPaper-Cosmoclub-27Feb2017.pdf)

$\Lambda$ CDM cosmology: successes, challenges, and opportunities for progress, Louisiana State University, Baton Rouge, LA, February 16

New Insights on Galaxy Formation from Comparing Simulations and Observations, Physics Colloquium, Duke University, February 1

**2016** President election speech, Sigma Xi Annual Meeting, Atlanta, December 11

Galaxy Formation: Simulations vs. Observations, Astronomy Colloquium, Ohio State University, November 10

Dark Matter: Visualizing the Invisible Universe, Deepak Chopra Sages & Scientists symposium, Beverly Wilshire Hotel, September 9

CANDELS Theory/Motivation, CANDELS meeting, Space Telescope Science Institute, Baltimore, MD, August 24

Galaxy Formation: Simulations vs. Observations, Santa Cruz Galaxy Workshop, UCSC, August 12

Discovering the Invisible Universe, COSMOS Discovery Lecture for high school students, UCSC, August 1

Dark Matter, Dark Energy, the Formation of Galaxies, and the Evolution of the Universe, SCIPP Reunion, UCSC, June 25

New Insights on Galaxy Formation by Comparing Simulations and Observations, Laboratorio Interinstitucional de e-Astronomia, Brazil (by Skype), June 23

Formation of Galaxies and Large-Scale Structure in the Universe, Concept Exchange, Santa Cruz, CA, June 5

Measuring All the Light in the Universe, Physics Colloquium, University of Utah, Salt Lake City, April 19 Slides: <http://physics.ucsc.edu/~joel/Primack-EBL-Utah.pdf>

How Can Physicists Help the Public Make Better Decisions About Science and Technology, Leo Szilard Lecture, American Physical Society Annual Meeting, Salt Lake City, April 17 Slides: <http://physics.ucsc.edu/~joel/Primack-SzilardLecture-Text&Slides.pdf>

New Insights on Galaxy Formation by Comparing Simulations and Observations, Distinguished Lecture, Scientific Computing and Imaging (SCI) Institute, University of Utah, Salt Lake City, April 15  
Slides: <http://physics.ucsc.edu/~joel/Primack-GalSimsvsObs-SCI-April2016.pdf>  
Video: <https://vimeo.com/album/2690857/video/169121636>

What New Data + Simulations Teach Us About Cosmic Structure Formation, Opening Lecture, Dark Matter 2016 conference, UCLA, February 17. Slides: <https://conferences.pa.ucla.edu/dm16/talks/primack.pdf>

## **2015**

Astronomy Colloquium, University of Texas, Austin, November 17

Discovering How Galaxies Form: Comparing Simulations with Hubble Images, NASA Presentation, Supercomputing 2015 (SC15), November 17

The View from the Center of the Universe, Clemson University, September 24 (with Nancy Abrams)

Formation of Galaxies and Large-Scale Structure in the Universe, Renaissance Weekend, Monterey, September 5

Cosmology & Culture: It's About Time, Renaissance Weekend, Monterey, September 4

The View from the Center of the Universe, Renaissance Weekend, Monterey, September 3 (with Nancy Abrams)

Dark Matter: History & Cosmology, LAMAT lecture, UCSC, June 25

How Does the Big Bang Overlap with Kabbalah? Moment Magazine symposium, Palo Alto Jewish Community Center, April 12

## **2014**

Comparing Observed and Simulated Galaxies, Carnegie Observatories Colloquium, Pasadena, CA, November 25

Measuring Extragalactic Background Light Using Gamma Rays, Jet Propulsion Laboratory Colloquium, Pasadena, CA, November 24

Cosmological Structure Formation, International Conference - The Philosophy of Cosmology, Tenerife, Canary Islands, September 13

The New Universe and the Human Future (with Nancy Abrams), Aspen Chapel, Aspen, CO, September 7

State of the Universe Report, Deepak Chopra's Sages & Scientists Conference, Carlsbad, CA, August 22

AGORA High-resolution Galaxy Simulation Comparison Project, Santa Cruz Galaxy Workshop and AGORA meeting, UCSC, August 16

The New Universe and the Human Future (with Nancy Abrams), plenary talk, Institute on Religion in an Age of Science 60<sup>th</sup> anniversary meeting, Star Island, NH, August 3

The New Universe and the Human Future (with Nancy Abrams), Glencoe Union Church, Glencoe, IL, July 13

The New Universe and the Human Future (with Nancy Abrams), Keynote talk for Neutrino Day celebration, Lead, SD, July 12

Supercomputing the Universe, Mt. Diablo Astronomical Society, Walnut Creek, CA, June 24

The New Universe and the Human Future (with Nancy Abrams), Osher Lifelong Learners meeting, UCSC, April 27

GalaxyZoo and the Zooniverse of Citizen Science, Interrogating Methodologies: Exploring Boundaries in Art & Science, UCSB, April 18

Simulating Galaxies and the Universe, Interrogating Methodologies: Exploring Boundaries in Art & Science, UCSB, April 18

AGORA high-resolution galaxy simulation comparison project, Computational Astrophysics: Approaching Exascale 2014-2020 conference, Lawrence Berkeley National Lab, March 22

Welcome talk about UC-HiPACC, Computational Astrophysics: Approaching Exascale 2014-2020 conference, Lawrence Berkeley National Lab, March 21

$\Lambda$ CDM cosmology: successes, challenges, possible detection of dark matter, opportunities for progress, Astronomy Colloquium, New Mexico State University, March 14

$\Lambda$ CDM cosmology: successes, challenges, and opportunities for progress, Opening Lecture, Dark Matter 2014, UCLA, February 26

Tensions in Galaxy Simulations, Near-Field Deep-Field Connections  
Conference, UC Irvine, February 14

- 2013** Supercomputing the Universe, Physics Colloquium, UCSC, October 31.
- Cosmic Evolution: A Scientific Creation Myth Like No Other, at California Academy of Sciences, October 12, with David Morrison, Eugenie Scott, Jill Tarter
- Measuring All the Light Since the Big Bang with Gamma Rays, Astronomy Seminar, University of Waterloo, September 18.
- ΛCDM Large Scale Triumphs and Small Scale Challenges, Cosmology Seminar, Perimeter Institute, Waterloo, Ontario, September 17.
- Supercomputing the Universe, Physics Colloquium, York University, Toronto, September 16.
- \*Supercomputing the Universe, Exascale Computing in Astrophysics conference, Ascona, Switzerland, September 8-13.
- Two Lectures on Modern Cosmology, School on Astroparticle and Underground Science, Asilomar, September 4.
- Simulations for CANDELS, CANDELS Team Meeting, University of Kentucky, August 27.
- \*The AGORA Project - Introduction and Rationale, Santa Cruz Galaxy Workshop and AGORA Workshop, August 16.
- \*Star Formation and Feedback in the AGORA Galaxy Simulation Comparison Project, lecture at the UC-HiPACC International Summer School on Astro-Computing 2013 on Star and Planet Formation, UCSC, July 23.
- History of Dark Matter, Introduction to Cosmology, Simulating the Universe - Lectures at the Institute for the Philosophy of Cosmology, UCSC, July 1,2,4.  
Slides: [http://physics.ucsc.edu/~joel/Primack-Lect1-LCDM\\_History.pdf](http://physics.ucsc.edu/~joel/Primack-Lect1-LCDM_History.pdf)  
<http://physics.ucsc.edu/~joel/Primack-Lect2-Cosmology-Intro.pdf>  
[http://physics.ucsc.edu/~joel/Primack-Lect3SuperComputing\\_the\\_Universe.pdf](http://physics.ucsc.edu/~joel/Primack-Lect3SuperComputing_the_Universe.pdf)  
Videos: <https://www.youtube.com/watch?v=qUsBZDATBpg>  
<https://www.youtube.com/watch?v=qUsBZDATBpg>  
<https://www.youtube.com/watch?v=Nwjz0s-K6OU>
- \*Supercomputing the Universe, Keynote talk, Vail Computer Elements Conference, Vail, Colorado, June 23.
- \*Assembling Galaxies of Resolved Anatomy (AGORA) Simulation Comparison Project, Galaxies within the Cosmic Web conference, University of Chicago, June 20.
- \*Supercomputing the Universe, Los Alamos National Laboratory PT Colloquium, May 9.

Extragalactic Background Light and Gamma-ray Attenuation, Seminar,  
Los Alamos National Laboratory, May 8.

\*Art and Science at UC-HiPACC, invited presentation at UC Institute for  
Research in the Arts Conference, UC Riverside, March 21-23.

Three Lectures on Challenges of Modern Cosmology, Jerusalem Winter  
School, December 30, 2012 - January 10, 2013.

## **2012**

Invited lecture on Extragalactic Background Light, Conference on  
Exploring the Non-Thermal Universe with Gamma Rays, Barcelona,  
November 7

The New Universe and the Human Future, lecture at Science and Non-  
Duality Conference, San Rafael, CA (with Nancy Abrams), October  
26

Cosmology with CDM and Dark Energy: Large-Scale Triumphs and  
Small-Scale Challenges, Physics Colloquium, Rutgers U, October 17

The New Universe and the Human Future, lecture at Rutgers University  
(with Nancy Abrams), October 15

Fairbanks Museum and Planetarium William Eddy Lecture at Lyndon  
State College, Lyndonville, VT (with Nancy Abrams), October 11

The New Universe and the Human Future, lecture at Peking University  
(with Nancy Abrams), September 18

$\Lambda$ CDM: Recent Simulations and Semi-Analytic Models, Large-Scale  
Triumphs, and Small-Scale Challenges, Kavli Institute for Astronomy  
and Astrophysics, Peking University, September 14

$\Lambda$ CDM: Bolshoi Sims, Large Scale Triumphs, and Small Scale  
Tribulations, National Astronomical Observatory China (NAOC),  
September 10

The Bolshoi Simulations of the Large-Scale Structure and the New High-  
Resolution Galaxy Simulation Comparison Project, Invited lecture at  
Kavli Institute for Theoretical Physics China COSMO12 Conference,  
Beijing, September 10

The New Universe and the Human Future, lecture at Shanghai Jiao-Tong  
University (with Nancy Abrams), September 7

$\Lambda$ CDM: Large-Scale Triumphs and Small-Scale Challenges, Physics  
Colloquium, Shanghai Jiao-Tong University, September 6

Keynote Talk: Simulating and Visualizing the Universe, and afternoon  
talk Exascale IT Requirements in Astronomy, Huawei HCC  
Conference, Shanghai, China, September 5

The Bolshoi Simulations and Semi-Analytic Models Compared with  
Observations, Shanghai Astronomical Observatory, September 4

Introduction and Rationale of the Galaxy Simulation Comparison Project,  
Santa Cruz Galaxy Workshop, August 17

Modern Cosmology Issues, Philosophy of Cosmology Conference, La  
Pietra Villa, Florence, Italy, July 24

I. Astrocomputing Challenges and Cosmological Visualizations, II.  
Simulating Galaxies and the Universe, lectures at International  
Summer School on Astrocomputing, San Diego Supercomputer  
Center, July 9 & 10

The New Universe and the Human Future, lecture at Institute for the  
Future, Palo Alto, CA (with Nancy Abrams), May 9

Art and Cosmology, Arts Dean's Lecture Series, UCSC (with Nancy  
Abrams), April 12

$\Lambda$ CDM: Triumphs and Tribulations, Stanford Astrophysics Colloquium,  
March 15

Keynote Lecture, Simulating Galaxies and the Universe, IEEE Aerospace  
Conference, Big Sky, MT, March 8

Consciousness of the Cosmos, Invited Lecture, Sages and Scientists  
Symposium, La Costa Resort, Carlsbad, CA, March 3

$\Lambda$ CDM: Triumphs and Tribulations, Opening Lecture, UCLA Dark Matter  
2012 Conference, Marina Del Rey, CA, February 22

## **2011**

The History of Dark Matter, Avishai Dekel 60<sup>th</sup> Birthday Symposium,  
Hebrew University, Jerusalem, Israel, December 14

The New Universe and the Human Future, Symposium on the New  
Human Story, Esalen Institute (with Nancy Abrams), December 5

Simulating and Visualizing the Universe, 2011 Technology Horizons  
Conference, Cavallo Point, CA, October 27

Dark Matter and Dark Energy, Why Is There Anything Conference, Yale  
University, October 7

The New Universe and the Human Future, Orcas Island, WA (with Nancy  
Abrams), September 18

The New Universe and the Human Future, Seattle Town Hall, Seattle,  
WA (with Nancy Abrams), September 14

The Bolshoi Simulations and Their Implications, Santa Cruz Galaxy  
Workshop, August 12

The Bolshoi Cosmological Simulations and Their Implications, Galaxy  
Formation Conference, Durham University, England, July 18

Radiation Fields in the Universe: Extragalactic Background Light and  
Gamma-ray Attenuation, Dublin School on High-Energy  
Astrophysics, Dublin College, Ireland, July 14

The New Universe and the Human Future, Adler Planetarium, Chicago, IL  
(with Nancy Abrams), July 8

The New Universe and the Human Future, Bookshop Santa Cruz, CA  
(with Nancy Abrams), July 5

Dark Matter Cosmology, Institute for Nuclear and Particle Astrophysics  
Conference, Asilomar, CA, April 23

The New Universe and the Human Future, Benjamin Dean Lecture,  
California Academy of Sciences, San Francisco (with Nancy  
Abrams), April 4

Science and Religion: Conflict or Concord – Jewish Perspective, Jain  
Temple, Milpetas, CA, March 26

The New Universe and the Human Future, Contra Costa Jewish  
Community Center (with Nancy Abrams), January 18

Simulating and Visualizing the Universe, CANDELS Meeting, STScI,  
Baltimore, MD, February 3

## **2010**

Invited Plenary Lecture, Extragalactic Background Light and Gamma-ray  
Attenuation, 25<sup>th</sup> Anniversary Texas Conference, Heidelberg,  
Germany, December 6-10.

Simulating and Visualizing the Universe, Astronomy Seminar, University  
of Colorado, Boulder, CO, October 22.

Simulating and Visualizing the Universe, BINRDI Seminar (with Nina  
McCurdy and Chris Henze), Advanced Studies Laboratories, NASA  
Ames Research Center, September 20.

Astrophysics with the Bolshoi Simulation, Opening Lecture, Santa Cruz  
Galaxy Workshop, August 16.

Cosmology and UC-HIPACC, Lecture at AstroComputing School, UCSC,  
July 26.

Lecture, Cosmology with Supercomputers, for NASA High End  
Computing Study, NASA Ames Research Center, June 29.

TV Interview by Mary Evelyn Tucker for Journey of the Universe project,  
June 19.

Informal lecture, Movie Industry Salon, Burton Chase Park, Marina del  
Rey, CA (with Nancy Abrams), April 18.

The Cosmic Context for the Human Future, Multimedia Keynote Lecture  
for In2Thinking Network 2010 Forum, Rocketdyne Leadership &  
Learning Center, Woodland Hills, CA (with Nancy Abrams), April 16.

Invited Lecture, Extragalactic Background Light with Gamma Ray Bursts  
and Blazars, The View from 5 AU conference, UC Irvine, March 25.



Invited Opening Lecture, Sources and Detection of Dark Matter and Dark Energy in the Universe, Marina del Rey, CA, February 24.

**2009**

Invited Lecture on University of California AstroComputing Institute, Supercomputer Simulations, and Using GPUs for Computation, SLAC Conference on Computational Astrophysics, November 30.

Dwight H. Terry Lectureship, Yale University, Cosmic Society: The New Universe and the Human Future (four lectures during two weeks, with Nancy Abrams), October 20, 21, 27, 28.

Astronomy Colloquium, A Brief History of Dark Matter, Yale University, October 22.

Multimedia Lecture, A Cosmic View of the Human Future, All Souls Unitarian Church, Manhattan (with Nancy Abrams), October 15.

Multimedia Lecture, Commonwealth Club, San Francisco (with Nancy Abrams), August 25.

Multimedia Keynote Lecture, Metanexus Conference on Cosmos, Nature, and Culture, Phoenix, AZ (with Nancy Abrams), July 19.

Lecture, A Brief History of Dark Matter, Keck Institute for Space Sciences Dark Matter Workshop, Caltech, July 13.

Participation in two panel discussions, Legacy of Galileo Public Symposium, Franklin Institute, Philadelphia, June 18-19.

Cosmological Supercomputer Simulation and Visualization, Astro-Viz 2009 Conference, California Academy of Sciences, San Francisco, May 7.

Lectures on Galaxies and Dark Matter at Annual School on Astronomy, National Observatory of Brazil, Rio de Janeiro, October 27, 28, 30, 31.

Book Group Lecture, Bookshop Santa Cruz (with Nancy Abrams), April 23.

Multimedia Lecture on Cosmology, Sons in Retirement, Portuguese Hall, Santa Cruz, April 1.

**2008**

Banquet Lecture, U.S. Army Science Conference, Orlando, FL (with Nancy Abrams), December 4.

Multimedia Lecture, Chicago Humanities Festival (with Nancy Abrams), November 8.

Multimedia Lecture, Staerckel Planetarium, Champaign, IL (with Nancy Abrams), November 6.

Lecture, Lutheran School of Theology at Chicago (with Nancy Abrams), November 5.

Multimedia Lecture on Cosmology at National Observatory of Brazil, Rio de Janeiro (with Nancy Abrams), October 31.

Lectures on Galaxies and Dark Matter at Annual School on Astronomy,  
National Observatory of Brazil, Rio de Janeiro, October 27, 28, 30, 31.

Multimedia Lecture on Cosmology at Universidade Federal de Minas  
Gerais (UFMG), Belo Horizonte, Brazil, with simultaneous Portuguese  
translation (with Nancy Abrams), October 29.

Multimedia Lecture on Cosmology at Pontifical Catholic University of  
Chile, Santiago (with Nancy Abrams), October 15.

Opening Plenary Lecture; Joint Closing Lecture (with Nancy Abrams),  
Cosmology Across Cultures Conference, Granada, Spain, September  
8-12.

Lectures, Public conference in Oslo to launch the Norwegian edition of  
*View from the Center of the Universe* (with Nancy Abrams), Oslo,  
Norway, September 5-6.

The View from the Center of the Universe: Discovering Our Extraordinary  
Place in the Cosmos, public lecture at Hebrew University of  
Jerusalem, June 22. Video: <https://www.youtube.com/watch?v=03Bb4sMMn18>

A Brief History of Dark Matter, Buhl Lecture, Carnegie Mellon  
University, April 22.

The Public Lecture of the 2008 Annual Meeting of the American Physical  
Society, May Hall, St. Louis Science Center, St. Louis, MO (with  
Nancy Abrams), April 14.

Public Lecture in The Center for Science and Spirituality Distinguished  
Lecture Series, "What it Means to be Human: Science, Consciousness  
and Our Place in the Universe," (with Nancy Abrams), March 27.

Public Lecture, sponsored by Center for Cosmology and AstroParticle  
Physics, Ohio State University (with Nancy Abrams), March 24.

Silicon Valley Astronomy Lecture, Smithwick Theater, Foothill College,  
Los Altos Hills, CA (with Nancy Abrams), January 23.

Luau Evening Lecture, Evolutionary Epic Conference, Makaha Resort,  
Oahu, Hawaii (with Nancy Abrams), January 6.

## **2007**

Teaching about cosmology at inner city high school YELLAW program,  
Oakland, CA (with Nancy Abrams), December 16 and 18.

Banquet Lecture, American Physical Society Division of Plasma Physics  
Annual Meeting, Orlando, FL, November 14.

Public Lecture, State University of New York, Geneseo, NY (with Nancy  
Abrams), October 18.

Lecture for Core Course, University of California, Merced (with Nancy  
Abrams), September 21.

Public Lecture, Queens University, Kingston, Ontario, Canada (with Nancy Abrams), September 13.

Public Lecture, Science North, Sudbury, Ontario, Canada (with Nancy Abrams), September 10.

Colloquium, Santa Fe Institute (with Nancy Abrams), July 19.

Keynote Lecture, International Society for the Study of Time Conference, Asilomar (with Nancy Abrams), July 19.

Public Lecture, St. Johns College, Santa Fe, NM (with Nancy Abrams), July 17.

J. Robert Oppenheimer Memorial Lecture, Los Alamos, NM, July 16.

Invited Lecture, The Future of the Universe May Depend on Us, The Future of Intelligence in the Cosmos workshop, NASA Ames Research Center, June 30.

Keynote Lecture, Epic and Futures Mini-Conference, The Presidio, San Francisco (with Nancy Abrams), June 16.

Public Lecture, University of Pennsylvania, Philadelphia (with Nancy Abrams), April 15.

Public Lecture, Michigan Center for Theoretical Physics, Ann Arbor, MI (with Nancy Abrams), April 9.

Public Lecture, Princeton Club of Northern California, San Francisco (with Nancy Abrams), March 1.

Lecture, Feast of Jewish Learning, Temple Beth Am, Los Altos (with Nancy Abrams), January 27.

Public Lecture, University of Texas, Austin (with Nancy Abrams), January 26.

**2006** Sigma Xi and Teilhard Society Lecture, Loyola Marymount University, Los Angeles (with Nancy Abrams), November 17.

What Physicists Do Colloquium, Sonoma State University (with Nancy Abrams), November 13.

Lecture on Cosmology, Advanced Imaging Conference, San Jose, November 11.

Public Lecture on Cosmology, Cambridge University (with Nancy Abrams), October 18.

Public Lecture on Cosmology, Institute for Advanced Studied, Dublin (with Nancy Abrams), October 16.

Public Lecture on Cosmology, Miller's Academy, London (with Nancy Abrams), October 12.

Public Lecture on Cosmology, Oxford University (with Nancy Abrams), October 11.

Public Lecture on Cosmology, Queen Mary University of London (with Nancy Abrams), October 10.

Public Lecture on Cosmology, University College, London (with Nancy Abrams), October 9.

Congregation Etz Chayim Yom Kippur presentation and study group (with Nancy Abrams), Palo Alto, CA, October 2.

Invited Lecture, Google NYC (with Nancy Abrams), August 25.

Closing summary lecture, UCSC Workshop on Galaxy Formation, August 10.

Invited lecture, IEEE Conference on Space Mission Challenges, Pasadena Conference Center, "Supercomputing for Cosmology," July 18.

Keynote Lecture, Evolutionary Salon on Transformational Philanthropy, Gold Lake Mountain Resort, Colorado, "The View from the Center of the Universe" (with Nancy Abrams), June 25.

Opening Lecture, conference at UC Irvine on Complementarity Between Dark Matter Searches and Collider Experiments, "Dark Matter: What Do We Know from Cosmology?" June 10, and invited talk, "Gamma Rays from Galactic Center," and Closing Panel Discussion on "Cosmology 2010-2020" June 11.

Lecture, Metanexus Conference on Continuity and Change, University of Pennsylvania, "World Views in Cosmology," June 4, and Keynote Lecture "The View from the Center of the Universe" (with Nancy Abrams), June 6.

Public lecture, Princeton University, "The View from the Center of the Universe" (with Nancy Abrams), June 2 (during Reunion festivities, attended especially by my 1966 classmates and their families).

Public lecture, Rittenhouse Astronomical Society, at Franklin Institute Fels Planetarium, Philadelphia, "The View from the Center of the Universe" (with Nancy Abrams), May 31.

Radio interview by Alan Cheuse for NPR "All Things Considered" announcement that *The View from the Center of the Universe* is one of their ten summer 2006 reading selections (with Nancy Abrams), May 31.

Live 40 minute radio interview by Leonard Lopate on WNYC-FM (NPR) (with Nancy Abrams), May 19.

Invited lecture, Sackler Black Hole Conference, Harvard University, "Galaxy Mergers: Simulations, Observations, and AGN," May 17.

Public lecture and booksigning, Harvard Observatory, "The View from the Center of the Universe" (with Nancy Abrams), May 16.

TV interview by Smoki Bacon and Dick Concannon, “The Literati Scene,”  
BNNTV Boston (with Nancy Abrams), May 16.

TV interview by Barry Kibrick (with Nancy Abrams) for “Between the  
Lines” half-hour show, at KLCS-TV Los Angeles (also subsequently  
broadcast on many other PBS-TV stations), May 12.

Radio interview (with Nancy Abrams) on Wisconsin PBS nationally  
syndicated radio program “To the Best of Our Knowledge,” at PBS  
Culver City, CA, studio, May 12.

Physics Colloquium, UC Irvine, “Successes and Potential Problems of  
LCDM,” May 11.

Public lecture, UC Irvine, “The View from the Center of the Universe”  
(with Nancy Abrams), May 10.

Public lecture, UCSC Media Theater, “The View from the Center of the  
Universe” (with Nancy Abrams), May 9.

Radio interview (with Nancy Abrams) “Focus 580” WILL-FM (NPR)  
Urbana, IL, May 9.

Booksigning, Bookshop Santa Cruz, “The View from the Center of the  
Universe” (with Nancy Abrams), May 8.

Radio interview by Seth Shostak (with Nancy Abrams) for “Are We  
Alone?” program on SETI Institute/Discovery Radio Channel, May 8.

Meet with faculty and students to discuss research, UC Berkeley, May 5.

Astrophysics seminar, UC Davis, “Galaxy Mergers: Simulations,  
Observations, and Active Galactic Nuclei,” May 4.

Public lecture, University of California, Davis, “The View from the Center  
of the Universe” (with Nancy Abrams), May 3.

Live radio interview (with Nancy Abrams), “Insight,” KXJZ-FM (NPR),  
Sacramento, May 3.

Sackler Lecture, University of California, Berkeley, “The View from the  
Center of the Universe” (with Nancy Abrams), May 2.

Astrophysics seminar, UC Berkeley, “Galaxy Mergers: Simulations,  
Observations, and Active Galactic Nuclei,” May 2.

Public lecture, Field Museum, “The View from the Center of the  
Universe” (with Nancy Abrams), Apr. 29.

Booksigning, Transitions Books, Chicago, “The View from the Center of  
the Universe” (with Nancy Abrams), Apr. 28.

Seminar, Kavli Institute of Cosmological Physics, University of Chicago,  
“Galaxy Mergers: Simulations, Observations, and Active Galactic  
Nuclei,” Apr. 28.

Radio interview (with Nancy Abrams) with Jerry Kay for "ENN Radio" (environmental news network), Apr. 28.

Live two hour radio interview (with Nancy Abrams) with Milt Rosenberg, Extension 720, WGN, Chicago, Apr. 27.

Public Lectures, California Academy of Sciences Boardroom, San Francisco, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 25.

Radio interview (with Nancy Abrams) "Berkeley Grocks," KALX-FM, Berkeley, Apr. 25.

Radio interview (with Nancy Abrams) with Moira Gunn, NPR "Technation" program, KQED, Apr. 25.

Invited lecture, "Evolution of the Universe," American Physical Society Annual Meeting, Dallas, Apr. 24.

Radio interview (with Nancy Abrams) with Bill Thompson for Metro Source Network "Eye on Books" (with Nancy Abrams), Apr. 21.

Photoshoot at National Air and Space Museum for Smithsonian magazine, Apr. 21.

Lecture and booksigning, Princeton Alumni of DC, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 20.

Treasury Executive Seminar and booksigning, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 20.

Booksigning, Border's, Vienna, VA, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 19.

Seattle Science Lecture, Seattle Town Hall, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 18.

Radio interviews, KMPS-FM, KUOW-FM (NPR), KBSG-AM, Seattle, Apr. 18.

Booksigning, Powell's Books, Portland, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 17.

Seminar, Reed College, "Galaxy Collisions," and Colloquium, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 17.

Booksigning, Cody's Books, Berkeley, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 14.

Frontiers of Science Lecture, University of Utah, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 12.

Radio interview, KCPW, Salt Lake City, Apr. 12.

Booksigning, Capitola BookCafe, "The View from the Center of the Universe" (with Nancy Abrams), Apr. 11.

Radio interviews, with Michio Kaku for “Explorations in Science” (on WBAI in New York, KPFA in Berkeley, and many other stations) and with John Batchelor for ABC Talk Radio, Apr. 11.

Public Lecture, Stanford University Physics Department, “The View from the Center of the Universe” (with Nancy Abrams), Apr. 10.

Institute on Strings, Astrophysics, and Cosmology (ISCAP) seminar, Columbia University, “Galaxy Mergers: Simulations, Observations, and Active Galactic Nuclei,” Apr. 7.

Public Lecture, Columbia University Observatory, “The View from the Center of the Universe” (with Nancy Abrams), Apr. 6 (publication day).

UCSC Halliday Lecture, University Inn and Conference Center, “The View from the Center of the Universe” (with Nancy Abrams), Mar. 9.

Invited talk, Santa Cruz chapter, National Writers Union, at Santa Cruz Public Library, “Writing About Cosmology” (with Nancy Abrams), Mar. 2.

Invited Opening Lecture, Conference on Sources of Dark Matter and Dark Energy (DM06), Marina del Rey, CA, “Precision Cosmology,” Feb. 12.

**2005**      Lecture for UCSC Alumni at NASA Ames Laboratory in conjunction with Inauguration of UCSC Chancellor Denton, “The Composition and Evolution of the Universe,” Oct. 19.

Nearly Normal Galaxies in a LCDM Universe -- Conference in Honor of 60<sup>th</sup> Birthdays of George Blumenthal, Sandy Faber, and me -- Invited Closing Talk, “Cold Dark Matter Comes of Age,” Aug. 12.

Chair, Forum on Physics and Society Executive Committee meeting, Awards Session and Business Meeting, American Physical Society Annual Meeting, Tampa, Apr. 15-18.

Invited Closing Summary Talk, Conference on Dynamics of Galaxies: Baryons and Dark Matter, University of Nevada, Las Vegas, Mar. 13.

**2004**      Interview, Columbia radio CARACOL, Dec. 18.

Invited Opening Lecture, symposium on The Big Bang to You and Me, American Geophysical Society annual meeting, San Francisco, “The Origin, Evolution, and Composition of the Universe,” Dec. 16.

NPR "All Things Considered" interview by David Kestenbaum on American Physical Society report on NASA Moon-Mars program, Nov. 19.

Invited Lecture/Colloquium, Kavli Institute for Theoretical Physics, Santa Barbara, program on Galaxy-Intergalactic Medium Interactions, "Galaxy Mergers: New Insights from New Simulations," Nov. 4.

Physics Colloquium, Brown University, "Galaxies and Gamma-Ray Cosmology," Oct. 18.

Lansdowne Lecturer, University of Victoria, Canada, Colloquium: "Gamma Ray Cosmology," Seminar: "Galaxy Mergers," Public Lecture: "Cosmology and 21st Century Culture," Sept. 21-23.

Invited Lecture, Conference on High Energy Gamma-Ray Astronomy, Heidelberg, Germany, "Gamma-Ray Cosmology," July 27.

Invited Lecture, Pasadena Conference Center, From Spitzer to Herschel and Beyond: The Future of Far-IR Space Astrophysics conference, "Predictions from Galaxy Modeling," June 8.

Invited Remarks and Panel Chair, 30th Anniversary Celebration of AAAS Congressional Fellowship Program, Carnegie Institution of Washington, May 14.

Temple Beth El, Aptos, Panel Discussion with Scientists, Apr. 26.

UCSC SCIPP seminar, "Writing About Physics," Apr. 5.

UCSC Friday Lunch Astronomy Seminar Hour, "The Status of Cosmology," Feb. 13.

## 2003

Opening Lecture (and two other lectures), Jerusalem Winter School on the Origin of Galaxies, Dec. 29.

DEEP meeting, lecture on Galaxy Interactions, Dec. 17.

Palo Alto Research Center (PARC) Colloquium, "Cosmology and Dark Matter," Nov. 19.

Carmel Valley Rotary Club, "State of the Universe Report," Dec. 9.

Institute on Geophysics and Planetary Physics Colloquium, LLNL, "Probing Galaxy Formation with Gamma Rays," Dec. 5.

Invited Public Lecture (with Nancy Abrams), Seattle Pacific University, "Cosmology and 21<sup>st</sup> Century Culture," Dec. 1 (also met with groups of faculty and students Dec 1-2).



University of Washington Physics colloquium, “Probing Galaxy Formation with Gamma Rays,” Dec. 1 (also met with cosmology group Dec. 2).

Invited Lectures on “Dark Matter Halo Shapes: Simulations, Analytic Models, and Observational Implications,” and “A Non-Parametric Approach to Galaxy Morphological Classification,” Banff Workshop on Galaxy Formation: A Herculean Challenge, Nov. 1-6.

Invited Presenter and Session Chairman, Kavli Institute Kickoff Meeting, SLAC, Oct. 18.

Invited Keynote Speaker, “Status of Cosmology,” Institute on Nuclear and Particle Astrophysics and Cosmology (INPAC) meeting, UCSD, Oct. 3.

Cosmology Seminar, Harvard Smithsonian Center for Astrophysics, “Faint End of the Luminosity Function,” Aug. 26.

Session Moderator and Summarizer, “How serious are the problems faced by Cold Dark Matter? Central density cusps, thin disks and dark halo substructure,” International Astronomical Union Symposium 220, Dark Matter in Galaxies, Sydney, Australia, July 22.

Invited Review Lecture, “The Origin and Distribution of Angular Momentum in Galaxies,” International Astronomical Union Symposium 220, Dark Matter in Galaxies, Sydney, Australia, July 24.

Invited lecturer and organizer, Workshop on Galaxy Formation, Institute for Advanced Studies of Hebrew University, Jerusalem, June 8-21.

Seminar, Max Planck Institute for Astrophysics, Garching, Germany, “Galaxy Formation and the Faint End of the Luminosity Function,” June 3.

Invited Review Lecture on “Galaxy Formation and the Faint End of the Luminosity Function,” Conference on Satellites and Tidal Streams, La Palma, Canary Islands, May 25-31.

Colloquium, Max Planck Institute for Physics, Munich, “Galaxy Formation, Extragalactic Background Light, and Gamma Ray Absorption,” May 13.

Physics Colloquium, University of Bonn, Germany, “Galaxy Formation, Extragalactic Background Light, and Gamma Ray Absorption,” May 2.

Invited Lecture, VERITAS Symposium on TeV Astrophysics, Adler Planetarium, Chicago, “Galaxy Formation, Extragalactic Background Light, and Gamma Ray Absorption,” Apr. 25.

Lecture for UCSC Student Pugwash Group, “Space Weapons and Space Debris,” Mar 3.

Seminar, Center for International Security and Arms Control, Stanford, Feb. 11.

Invited Lecture, Conference on God and Physical Cosmology, Notre Dame University, Jan. 31.

**2002**      Invited Closing Panel Speaker, Conference on Challenges to the Standard Paradigm: Fundamental Physics and Cosmology, National Academy of Sciences Beckman Center, UC Irvine, Nov. 3.

Invited Lecture, COSPAR Conference, Houston, “Probing Galaxy Formation with Gamma Rays,” Oct. 11.

Invited Lecture, Space Policy Seminar, Naval Postgraduate School, Monterey, “Debris and Future Space Activities,” Sept. 12.

Invited Closing Speaker, Conference on Small-Scale Issues in Dark Matter, University of Chicago, Aug. 2.

Invited Lecture, New Dimension in Astroparticle Physics Conference, Gran Sasso Laboratory, Italy, “Status of Cold Dark Matter Cosmology,” July 15.

Invited Public Lecture, Making Light of Gravity Conference, Cambridge University, “Status of Cold Dark Matter,” July 12.

Invited Public Lecture, Ronald Hoffmann Science Cabaret at Cornelia St. Café (with Nancy Abrams), New York, June 2.

Seminar, Center for Energy and Environmental Studies, Princeton, “Debris and Future Space Activities,” May 31.

Invited Keynote Lecture, Conference on Future Security in Space, New Place (near Southampton, England), “Debris and Future Space Activities,” May 28.

Astronomy Colloquium, Oxford, “The Nature of Dark Matter,” May. 27

Public Lecture, New College, Oxford, “Space Debris and Star Wars,” May 27.

RPM Lecture, Lawrence Berkeley Laboratory, “Space Debris and Star Wars,” May 23.

Colloquium, Lawrence Livermore National Lab, “The Nature of Dark Matter,” May 17.

Colloquium, Carnegie Observatories, Pasadena, “Nature of Dark Matter,” May 7.

Invited Lecture, Science and the Quest for Meaning, UNESCO Headquarters, Paris, “Star Wars Forever? – A Cosmic Perspective,” Apr. 19.

Invited Opening Speaker, 5<sup>th</sup> International UCLA Symposium on Sources and Detection of Dark Matter and Dark Energy, Marina del Ray, “Status of Cold Dark Matter Cosmology,” Feb. 20.

Physics Seminar, Caltech, "Probing Galaxy Formation with High Energy Gamma Rays," Feb. 19.

IPAC Seminar, Caltech, "Masses and Other Properties of High-Redshift Galaxies," Feb. 19

Astronomy Colloquium, University of Texas, Austin, "The Nature of Dark Matter," Jan. 29

Physics Colloquium, UCSC, "The Nature of Dark Matter," Jan. 3

**2001**

Invited Speaker, AAAS Public Forum with Rabbi Lawrence Kushner, Washington, DC, Nov. 29.

Gravity Group Seminar, Princeton Physics Department, "Masses of LBGs," Nov. 16.

Invited Lecture, H.E.S.S. Meeting at Ringberg Castle, "Dark Matter Cosmology," Nov. 19

Invited Lecture and Participant in Closing Panel Discussion, ESO Conference on the Mass of Galaxies at Low and High Redshift, Venice, "Lyman Break Galaxy Masses," Oct. 24-26.

Theory Seminar, Max Planck Institute for Astrophysics, Garching, "Lyman Break Galaxy Masses," Oct. 23.

Invited Talk/Concert (with Nancy Abrams), Deutsches-Amerikanisches Institut Heidelberg, Oct. 17.

Seminar, Max Planck Institute for Astrophysics, Garching, "Lyman Break Galaxy Masses," Oct. 23.

Invited Lecturer, International School of Space Science, L'Aquila, Italy, "The Nature of Dark Matter" and "Probing Galaxy Formation with High Energy Gamma Rays," Oct. 2-4.

Invited Plenary Lectures on dark matter and gamma ray astronomy, Snowmass workshop on particle astrophysics, July 18.

Taping for Austrian TV documentary, Apr. 20; interview by Hideki Miyamoto, producer of NHK Japanese TV show on astronomy, May 7.

BBC Science Radio interview by Molly Bentley, Mar. 30.

Invited Speaker, Symposium on The Historical Sciences and Their Importance in Public Education at AAAS Annual Meeting, San Francisco, "The History of the University," Feb. 19.

Participant, Discussion on Cosmology at Center for Theology and the Natural Sciences Workshop, Berkley, Jan. 5

**2000**

- Physics Colloquium, Stanford, "State of the Universe Report: Cold Dark Matter and All That," Nov. 7.
- Physics Colloquium, Department of Mathematics and Theoretical Physics, Cambridge, "Is Cold Dark Matter in Trouble?" Oct. 27.
- Popular Lecture, Cambridge University, "Science and the Spiritual Imagination" (with Nancy Abrams), Oct. 25.
- Invited Lecture, Los Medanos College, Pittsburg, CA, "God and the Big Bang" (with Nancy Abrams), Oct. 25.
- Popular Lecture, Queen Mary College, London, "Science and the Spiritual Imagination" (with Nancy Abrams), Oct. 23.
- Physics Colloquium, Queen Mary College, London, "Is Cold Dark Matter in Trouble?" Oct. 23.
- Invited Opening Lecture, "Cold Dark Matter Cosmology: Status and Open Questions," Sept. 4.
- Invited Lecture, World Congress of the Systems Sciences, Ryerson Polytechnic University, Toronto, "Can There Be a Reconciliation Between Science and Religion," July 21.
- Invited Lecturer, Iceland 2000: Faith in the Future Conference, July 6.
- Invited Lecturer, NATO Advanced Study Institute on Recent Developments in Particle Physics and Cosmology, Cascais, Portugal, "Dark Matter and Large Scale Structure: I. Cosmological Parameters; II. Cold Dark Matter Cosmology: Status and Open Questions; III. Probing Galaxy Formation with High Energy Gamma-Rays," July 3-4.
- Invited Lecture, Gamma2000: Second Heidelberg workshop on High Energy Gamma-Ray Astronomy, "Probing Galaxy Formation with High Energy Gamma-Rays," June 27.
- Invited Lecture, Vatican Conference Galaxies Disks and Disk Galaxies, "Evolution of Mass Distribution in CDM Halos," June 14.
- Colloquium, European Southern Observatory, "The Extragalactic Background Light from UV to Far-IR," June 8.
- Invited Lecture, State of the World Forum, NY, "Cosmology and Culture" (with Nancy Abrams), June. 8.
- Colloquium, Potsdam Astrophysics Institute, "Lambda CDM Cosmology Overview: Successes vs. Possible Problems," June 7.
- Colloquium, Max Planck Institute for Physics, Munich, "Parameters and Open Questions of Cosmology," May 30.
- Physics Colloquium, Max Planck Institute for Physics, Munich, "State of the Universe Report," May 25.

Colloquium, Institute of Astronomy, Cambridge, England, "The Extragalactic Background Light from Galaxies: Semi-Analytic Calculations vs. Observations from UV to Far-IR," Apr. 28.

Seminar, Queen Mary College, London, "The Extragalactic Background Light from Galaxies: Semi-Analytic Calculations vs. Observations from UV to Far-IR," Apr. 28.

Invited Lecture, North American Montessori Teachers Association meeting, "The Emerging Universe Perspective and Its Implications" (with Nancy Abrams), Apr. 1.

Invited talk on galaxy rotation curves, Galaxy Formation Conference at Institute for Theoretical Physics, UCSB, Mar. 15.

Astronomy Seminar, Princeton, Feb. 25.

Invited Opening Lecture, DM2000: 4<sup>th</sup> International Symposium on Sources and Detection of Dark Matter in the Universe, Marina del Rey, California, "Cosmological Parameters 2000," Feb. 20.

Invited Lecture, Western Oregon University, "Cosmology and Culture" (with Nancy Abrams), Jan. 21.

Invited INPA talk at LBL, "Observational and Theoretical Constraints on *Omega matter*," Jan. 17.

Participant, Discussion on Cosmology at Center for Theology and the Natural Sciences Workshop, Berkley, Jan. 15.

## 1999

Spokesperson, International Advisory Committee for Large Scale Structure, and Lecture, "Measuring Omega-matter", Conference on Particles, Strings, and Cosmology (PASCOS99), Granlibakken Conference Center, North Lake Tahoe, Dec. 10-16.

Lecture on Cosmology at SCIPP Conference for Santa Cruz area high school science teachers, Nov. 13.

TV interview for "What's Up with the Universe," documentary for Public Broadcasting System, Oct. 9.

TV interview for documentary on Astronomy, Shanda Productions (Montreal-based science documentary producers), Oct. 5.

Guest Lecture, History 80A, "Origins of the Universe", Sept. 28.

Forchheimer Visiting Professor, Hebrew University, Sept. 10-20.

Opening Speaker, "Cosmological Parameters", 6th Conference on Topics in Astroparticle and Underground Physics (TAUP99), College de France, Paris, Sept. 5.

Co-Organizer (with S. Faber), UCSC Summer Workshop on Cosmology and Galaxy Formation, Aug.

Opening Speaker and session chair, International Conference on Cosmic Flows, "Status of Cosmological Parameters", University of Victoria, British Columbia, July 13-18.

Participant and session chair, "Hy z Universe" Conference, UC Berkeley, June 21-24.

Invited Lecture, Annual Meeting of AAAS Pacific Division, San Francisco State University, "State of the Universe", June 21.

Co-Organizer and Opening Speaker, Cosmic Questions Conference, at Smithsonian National Museum of Natural History, Washington, D.C., sponsored by the American Association for the Advancement of Science, April 14-16.

Physics Colloquium, University of Maryland, "State of the Universe Report", Apr. 13.

Astronomy Colloquium, Johns Hopkins University, "Galaxy Formation and the Nature of High Redshift Galaxies", Apr. 12.

Astronomy Seminar, Princeton University, "Probing Galaxy Formation with TeV Gamma Ray Absorption", April 12.

Talk, "State of the Universe Report", Anritsu Engineering Excellence Forum, Chaminade, April 6.

Talk, "State of the Universe Report", for Peninsula Astronomical Society, Foothill College, Mar. 12.

Colloquium, Stanford University Center for Space Science and Astrophysics, "Galaxy Formation and the Nature of High-Redshift Galaxies", Feb. 24.

Invited Lecture, Stanford Presidential Symposium on Cosmologies and Worldviews, Feb. 19.

Astronomy Seminar, "Nature of the Earliest Galaxies", Arizona State University, Feb. 12-14.

Invited lecturer and discussant, Shabbaton on Judaism and Science, Arizona State University, Feb. 12-14.

UCSC Hillel Lecture Series talk with (Nancy Abrams), "Cosmology and Culture", Feb. 9.

Lecturer and co-organizer, "Before the Beginning" symposium AAAS Annual Meeting, Anaheim, Jan. 24.

Invited Lecture, "Cosmology and Culture", Conference on Science and Judaism, Palais de Luxembourg, Paris, Jan. 16.

Astronomy Seminar, Inst. d'Astrophysique, Paris, "The Extragalactic Background Light and Implications for TeV Gamma-Ray Absorption," Jan. 14.

**1998**

Invited Lecture, "Galaxy Formation and the Nature of High Redshift Galaxies", and member of Scientific Organizing Committee, COSM098 conference, Asilomar, Nov. 15-20.

Courant Institute, NYU, Numerical Analysis Seminar, "Cosmological Simulations: Successes, Limitations, Future Directions", Oct. 30.

Colloquium, Physics Department, NYU, "Possible Role of Neutrinos in Cosmological Structure Formation," Oct. 29

Seminar, Physics Department, Harvard University, "Possible Role of Neutrinos in Cosmological Structure Formation, Oct. 28.

Seminar, "Semi-Analytic Modelling of Galaxy Formation", Harvard-Smithsonian

Center for Astrophysics, Oct. 16.

Invited Lecture, "Probing Galaxy Formation with TeV Gamma Ray Absorption", and member of Scientific Organizing Committee, VERITAS Workshop on TeV Astrophysics of Extragalactic Sources, Harvard College Observatory, Oct. 23-24.

Forchheimer Visiting Professor, Hebrew University, Sept. 20-Oct. 22.

Lecture "Structure Formation in the Universe with Light Neutrinos", Workshop on Relic Neutrinos (RELINCNU98), International Center for Theoretical Physics, Trieste, Italy, Sept. 17.

Participant in Grace Cathedral Forum on Science and the Spiritual Quest with RealAudio webcast, San Francisco, Sept. 13.

Joint Physics-Computer Science Colloquium, University of San Francisco, "State of the Universe Report", Sept. 10.

Co-organizer (with S. Faber), UCSC Workshop on Galaxy Formation and Evolution, August, with conference Aug. 20.

Invited Lecture: "Is There More to the Universe Than We Observe?" at Wonderfest 98, Stanford University, Aug. 16.

Galaxy Dynamics meeting at Rutgers, invited speaker with support, Aug. 8-11; invited lecture: "Formation of Dark Matter Halos"

Visiting Scientist, Institut d'Astrophysique de Paris, July 5-12.

Invited Lectures, "Cold + Hot Dark Matter After SuperKamiokandae" and "The Star Formation History in a Hierarchical Universe". Xth Rencontres De Blois: The Birth of Galaxies, Blois, France, July 3.

Lecture "Cosmology and Culture", Science and the Spiritual Quest Conference, UC Berkeley, June 8.

Los Alamos P/T Colloquium, "Status of the Universe", and seminar, "TeV Gamma Ray Absorption", April 30.

Invited participant and speaker, meeting on Current Problems in Cosmology, New Mexico State University, April 26-28.

Astronomy Seminar, Princeton University, "Nature of High Redshift Galaxies", April 23.

Invited Talk, "TeV Gamma Ray Absorption", in Symposium on High Energy Gamma Ray Probes of Cosmic Particles and Fields, American Physical Society meeting, Columbus, Ohio, April 18.

Invited lecture at Sources of Dark Matter conference, Santa Monica, "Galaxy Formation with Various Sorts of Dark Matter", Feb. 19.

Keynote Speaker, Templeton Awards Luncheon, AAAS annual meeting, Philadelphia, Feb. 15.

Lockheed Martin Colloquium, "Status of Universe", Feb. 5.

## **1997**

Lecturer, Jerusalem Winter School on Cosmology, Dec. 29, 1997-Jan. 7, 1998.

Participant, Science and the Spiritual Quest Cosmology meeting, Menlo Park, Dec. 12-15.

Talk on "Cosmology and Culture", to the UCSC Lifelong Learning Group, Nov. 16.

Opening Speaker, "Cosmic Origins: Evolution on the Grand Scale", Epic of Evolution Conference, sponsored by AAAS at the Field Museum, Chicago, Nov. 12-14.

Seminar, Fermilab, "Galaxy Formation and Evolution", Nov. 11.

Invited Lecture in Odyssey series at California State University, Long Beach, "Cosmology and Culture", Oct. 28.

Stanford Physics Colloquium: "Status Report on the Universe", Oct. 14.

Guest Lecture in UCSC Course, Global History, 80A, Sept. 29.

Invited Lecture, COSM097 Conference, Lancaster, UK, "Status of Cosmological Parameters", Sept. 15-19.

Lecturer, "D. Chalonge" 6th Astrofundamental Physics School, Erice, Italy, Sept. 6-13.

International Conference on Computational Physics, UCSC-Chair, session on "Particles and Astrophysics", Aug. 26.

Participant, Galaxy Halos Meeting, UCSC, Aug. 11-15.

Invited Lecture at Clusters Conference, Ruidoso, New Mexico, May 27 - June 1, "Clusters in CDM-type Models".



Participant, Center for Theology and the Natural Sciences (CTNS) on Science and the Spiritual Quest (SSQ) conferences of cosmologists and physicists, Graduate Theological Union, Berkeley, May 3-8.

Lecture on TeV Gamma Rays at Institute on Nuclear and Particle Astrophysics (INPAC) General Meeting at LBL, May 3.

UCSC representative to UCOP Conference on Physics, LBL, April 4-5.

Lecture on Careers in Astrophysics at UCSC careers Conference, Mar. 8.

Invited Lecture, "The Beginning of Time", symposium on The Nature of Time, American Association for the Advancement of Science Annual Meeting, Seattle, Feb. 16.

UCSC Physics Colloquium, "Inflation", Feb 6.

Talk at Santa Cruz Mid-County Exchange Club, "Dark Matter", Jan. 14.

## 1996

KUSP radio interview by Eric Scheck, Dec. 30.

Invited Lecture on "Status Report on the Universe" at National Science Teachers Association Global Summit, San Francisco, Dec. 29.

Lecture in Physics 10: "DM in the Universe", Nov. 12.

Lecture on "The Origin of the Universe" in UCSC course History 80A "Big History", Fall Quarter.

Participant in conference on Dark Matter in Astro- and Particle Physics, Heidelberg, Sept. 16-20. Invited Lectures: "Cold + Hot and Other Dark Matter Cosmological Models vs. Observations" and "Current Status of the Cosmological Parameters."

Invited Lectures, D. Chalonge School on Advances in Astro-Fundamental Physics, Erice, Sicily, "The Cosmological Parameters" and "Dark Matter and Structure Formation: CHDM vs. LCDM," Sept. 7-14.

Lecture, Lick Observatory Music of the Spheres series, "From Smallest to Largest: Connections Across the Universe," July 20 (with Nancy Abrams).

Invited Lecture, Princeton University 250th Anniversary Conference: Critical Dialogs in Cosmology, "The Best Theory of Cosmic Structure Formation is Cold + Hot Dark Matter (CHDM)," June 26

XVII International Conference in Neutrino Physics and Astrophysics (Neutrino 96), Helsinki, Finland, "Cosmological Structure Formation With and Without Hot Dark Matter," June 18.

Presentation in Suresh Lodha's course on CyberArt, Porter College, May 13.

Ylem Forum presentation, Exploratorium, San Francisco, "The New Big Bang: Cultural Repercussions of the Revolution in Cosmology," May 8.

Colloquium, Institute for Theoretical Physics, UCSB, "What is the Dark Matter? A Status Report on Current Cosmology," May 1.

Invited Lecture, UC System-wide INPAC Meeting, Irvine, "Status of the Cosmological Parameters," Apr. 26.

Presentation at Temple Shir Hadash, Los Gatos: "Cosmology and Kabbalah," Mar. 16 (with Nancy Abrams).

Seminar at NASA Goddard Space Flight Center, Greenbelt, MD, "What is the Recipe for Dark Matter?" Feb. 22.

Invited Presentation, DOE SAGENAP Meeting, Washington, D.C., "Active Galactic Nuclei as Laboratories for High Energy Physics," Feb. 22.

Second UCLA Conference on Sources of Dark Matter, Organizing Committee and Invited Lecture, "Dark Matter and Structure Formation: CHDM vs.  $\Lambda$ CDM," Feb. 15.

Radio interview about cosmology on Quirks & Quarks, Canadian Broadcasting Co., Jan. 31.

Radio interview with Justin Warner, AAAS Science Update/Why is it? about the "Big Bang," Jan. 30.

Seminar speaker and organizer, Workshop on Formation of Structure in the Universe, Institute for Advanced Studies, Hebrew University, Jerusalem, Jan. 7-19.

## **1995**

Jerusalem Winter School on Formation of Structure in the Universe, Lecture series on "Dark Matter and Structure Formation in the Universe" including opening lecture of the school, Dec. 27, 1995 - Jan. 5, 1996.

Astronomy Seminar, Johns Hopkins University, Baltimore, MD, "Low-Omega CDM with a Cosmological Constant: Too Much Small Scale Power," Nov. 14.

Science Table, Crown College, "Cosmology and Culture" (with Nancy Abrams), Oct. 18.

Lecture at Temple Kol Shofar, Tiburon: "The New Big Bang: Cultural Repercussions of the Revolution in Cosmology" (with Nancy Abrams), Oct. 7.

Physics Colloquium, University of Arizona, "Cold + Hot Dark Matter and Other Theories of Cosmic Structure Formation," Sept. 18.

Lecture Series, European Community Theoretical Astroparticle Network (TAN) Summer School and Workshop in Astroparticle Physics, Vigso, Jutland, Denmark, "Dark Matter," Aug. 14-19.

Invited Plenary Lecture, 14th International Conference on General Relativity and Gravitation (GR14), Florence, Italy, "Dark Matter, Observation & Theory," Aug. 9

Co-Director, Italian Physics Society "Enrico Fermi" School on Dark Matter, Varenna, Italy, July 24-Aug. 5; Opening Lecture: "Status of Cosmological Parameters: Can  $\Omega=1$ ?" July 25; Lecture: "Improved Ways of Comparing Simulations to Data," Aug. 2.

Physics Colloquium, University of Perugia, Italy, "Cold + Dark Matter," July 19.

Physics Colloquium, University of Milan, Italy, "Cold + Hot Dark Matter," July 10.

Invited Lecture, Workshop on Science and Religion Courses, Center for Theology and the Natural Sciences, Graduate Theological Union, Berkeley: "Modern Cosmology and Medieval Jewish Mysticism."

Invited Plenary Lecture, International Symposium on Weak and Electromagnetic Interactions in Nuclei (WEIN'95), Osaka, "Neutrinos as Dark Matter," June 13.

Interview and filming session, Australian Broadcasting Corp., QUANTUM Science TV news program, with grad students Romeel Dave, Michael Gross, and Rachel Somerville, and collaborators Nancy Abrams and Richard Nolthenius, UCSC, May 11.

Invited Lecture, UCLA workshop on neutrinos, "Status of Cold + Hot Dark Matter," May 12.

Lecture, Graduate Theological Union, Berkeley, "The New Big Bang: Cultural Repercussions of the Revolution in Cosmology," April 25 (with Nancy Abrams).

CfPA Seminar, UC Berkeley, "Testing Cold + Dark Matter (CHDM) and Flat Low- $\Omega$  CDM ( $\Lambda$ CDM): New Statistics and New Methods," April 25.

Colloquium, Institute for Astronomy, University of Hawaii, "Cold + Hot Dark Matter" (with video), April 11.

Invited Lecture, Moriond Astrophysics Meeting, Les Arcs, French Alps, "Better Methods for Comparing Simulations to Data" (with video), Mar. 16.

Colloquium, CERN, Geneva, Switzerland, "Cosmological Implications of Light Neutrinos: Cold + Hot Dark Matter and Large Scale Structure" (with video), Mar. 10.

Astroparticle Seminar, CERN, Geneva, Switzerland, "Hot Dark Matter Candidates?," Mar. 10.

Invited Lecture, Institute for Theoretical Physics, UCSB, CMB workshop, "Status of Cold + Hot Dark Matter Cosmologies," Feb. 23.

Lecture, Santa Cruz Astronomy Club, "What is the Dark Matter: Status Report on Current Cosmology," Feb. 16.

Invited talk, Aspen Winter Conference on Particle Physics, "Status of Hot/Cold Dark Matter," Jan. 6.

## 1994

NASA Ames Space Science Division Seminar, "Status Report on the Universe: Visualizing Large Scale Structure and Dark Matter," Nov. 29.

Theoretical Astrophysics Seminar, Fermilab, "Cold + Hot Dark Matter," (with video), Oct. 25.

Lecture, Chicago Center for Religion and Science, "The New Big Bang: Cultural Repercussions of the Revolution in Cosmology" (with Nancy Abrams), Oct. 24.

Astronomy Seminar, University of Michigan, "How Can  $\Omega(1h^{-1}\text{Mpc})=0.2$  in Simulations?", Oct. 21.

Physics Colloquium, University of Michigan, "Cold + Hot Dark Matter," Oct. 19.

Invited Lecture, Conference on TeV Gamma-Ray Astronomy, Heidelberg, "Probing the Era of Galaxy Formation via TeV gamma Ray Absorption by the Near Infrared Extragalactic Background," Oct. 7.

Astronomy Colloquium, UC Berkeley, "Cold + Hot Dark Matter," Oct. 1

Invited Lecture, Nobel Symposium on Trends in Astroparticle Physics, Stockholm, Sweden, "Cold + Hot Dark Matter," Sept. 24.

Physics Colloquium, Racah Institute, Hebrew University, Jerusalem, "Implications of Possible Discovery of Neutrino Mass," Sept. 24.

Lecturer, SLAC Summer Institute: three Lectures on "Dark Matter and Large-Scale Structure," Aug. 10-12.

Chairman, Sessions on Cosmology, American Physical Society Division of Particles and Fields Annual Meeting, University of New Mexico, Albuquerque, NM; Introductory Talk, "Status of Cosmological Parameters," August 5.

Invited Plenary Lecture, Snowmass Workshop on Particle and Nuclear Astrophysics and Cosmology in the Next Millennium, "Status of the Cosmological Parameters," July 16.

Invited Lecture, Meeting on Jewish Philosophy of the Natural World, Pawling, NY, "Quantum Cosmology and Kabbalah," May 22.

Astronomy Colloquium, UCLA, "Cold + Hot Dark Matter," April 12.

Physics Colloquium, San Francisco State University, "Cosmology after COBE," March 14.

Invited Lecture, Explorer Scout Science and Technology Conference, San Jose, CA, "Cosmology," March 5.

Physics Colloquium, University of Missouri, St. Louis, "Cosmology with Cold + Hot (Neutrino) Dark Matter, March 3.

Physics Colloquium, Ohio State University, "Cosmology with Cold + Hot (Neutrino) Dark Matter," March 1.

Invited Lecture, AAAS Annual Meeting, "Cosmology and Culture, Feb. 23.

Invited Lecture, CfpA Conference on Low Background Detectors, "Cold + Hot Dark Matter" (with video), Feb. 21.

Invited Lecture, UCLA Conference on Sources of Dark Matter, "Cold + Hot Dark Matter" (with video), Feb. 17.

Space Sciences Seminar, UC San Diego, "Cosmology with Cold + Dark Matter" (with video), Feb. 15.

Astronomy Colloquium, New Mexico State University, "Cold + Hot Dark Matter" (with video), Jan. 24.

## 1993

UCSC Physics Colloquium: "Cosmology with Cold + Hot (Neutrino) Dark Matter", Dec. 2.

Lecture at end of Shabbat service, Temple Beth-El, Santa Cruz: "The Religious Significance of Big Bang Cosmology" (with Nancy Abrams), Nov. 12.

Physics Colloquium, Stanford University: "Cosmology After COBE: Cold + Hot Dark Matter and Alternatives", Oct. 12.

Colloquium, Instituto Astrofisica Andalusia, Granada, Spain: "Extended Spiral Galaxy Rotation Curves: Theory and Data", Oct. 8.

Invited Lecture and Seminar at International School on Cosmological Dark Matter, Valencia: "Structure Formation in the Universe," "Cold + Hot Dark Matter and Alternatives", Oct. 5.

Physics Colloquium, Universita Autonoma de Madrid (UAM), Spain: "Cosmology with Cold + Hot (Neutrino) Dark Matter", Oct. 4.

Invited Lecture, Exploring the Universe lecture series, Morrison Planetarium, San Francisco: "Dark Matter and the Origin and Fate of the Universe" (with Nancy Abrams), Sept. 28.

Heinz Pagels Memorial Lecture, Aspen Institute for Humanistic Studies: "Cosmology and Culture: Implications of Recent Cosmological Discoveries" (with Nancy Abrams), Aug. 25.

Senior Participant, Workshop on Cosmology, Aspen Center for Physics;  
Lecture and video presentation, Aug. 25: "Cold + Hot Dark Matter",  
Aug. 16-27.

Organizer, UCSC Workshop on Cold + Hot Dark Matter, July 27.

Physics Colloquium, University of Oregon: "Cosmology After COBE:  
Cold + Hot Dark Matter and Alternatives, April 15.

Invited Lecture, Symposium on the Religious Significance of Big-Bang  
Cosmology, Annual Meeting of the American Association for the  
Advancement of Science, Boston: "Quantum Cosmology, Eternal  
Inflation, and God", Feb. 14.

Physics Colloquium, MIT: "Cosmology After COBE: Cold + Hot Dark  
Matter and Alternatives, Feb. 11.

Lecture Series, BCSPIN International School on Particles and Cosmology,  
Puri, India: "Dark Matter, Galaxies, and Large Scale Structure in the  
Universe", Jan. 2-8.

## 1992

Invited Lecture at the Inauguration of the Inter-University Center for  
Astronomy and Astrophysics, Pune, India: "Cold + Hot Dark Matter",  
Dec. 27.

Invited Opening Lecture, X DAE Symposium on High Energy Physics,  
Tata Institute, Bombay, India: "Cosmology After COBE: Review for  
High Energy Physicists", Dec. 26.

Colloquium, IBM Almaden Research Center: "The Early Universe --- A  
Status Report", Oct. 30.

Colloquium at Carnegie Observatories, Pasadena: "Cosmology After  
COBE.

Physics Colloquium at Centre d'Etudes Nucleaires de Saclay, France:  
"Cosmology After COBE", July 30.

IV Rencontre de Blois (Chateau de Blois, France): Invited Conference  
Summary Lecture, June 20.

IV Rencontre de Blois Seminar: "Cluster Correlations Favor Cold plus Hot  
Dark Matter", June 19.

UCSC Physics Colloquium: "Cosmology After COBE", May 21.

SLAC Theoretical Physics Seminar: "Cosmology After COBE", May 20.

Invited lecture, 2nd UCLA Conference on High Energy Neutrino and  
Gamma Ray Cosmology: "Cluster Correlations in Hot + Cold Dark  
Matter and Other Models", Feb. 13.

- 1991** University of Florida Physics Seminar: "Cosmology After COBE", Dec. 10.
- Sonoma State University "What Physicists Do" Colloquium: "The Beginning and End of Time" (videotaped and also shown at Chico State, etc.) March 25.
- 1990** UCSC Physics Colloquium: "Dark Matter: WIMPs and MACHOs" October 18.
- CfPA Seminar, UC Berkeley: "Large-Scale Periodicity: Is There Anything to It" September 18.
- Kyoto University Astrophysics Seminar: "Periodicity of Large Scale Structure?" September 11.
- Tokyo IUPAP Conference on Primordial Nucleo-synthesis and the Evolution of the Early Universe: invited talk on "Non-Zeldovich Fluctuations from Inflation" September 6.
- Oxford Conference on Galaxies at High Redshift: Invited talk on "The Formation of Galactic Disks" August 2.
- Oxford University Physics Seminar: "Search for Dark Matter" July 27.
- Durham University Astrophysics Seminar: "Models for Periodicity of the Galaxy Distribution" July 12.
- Durham University Physics Colloquium: "Search for Dark Matter" July 11.
- Conference on Large Scale Structure in the Universe, Institute for Advanced Studies of Hebrew University: invited talk on "Periodicity of Large Scale Structure" and concluding talk on "Status of Cold Dark Matter" June 4-8.
- Bezalel Art Academy, Jerusalem: popular talk "Beginning and End of Time" July 4
- Hebrew University Institute for Advanced Studies seminar on "Non-Gaussian Fluctuations" May 17.
- Tel Aviv University Physics and Astrophysics Seminar: "Dark matter detection: Searching for MACHOs and WIMPs" May 10.
- Hebrew University Physics Seminar: "Searching for MACHOs" May 1
- Co-organizer, CfPA Workshop on Baryonic Dark Matter, UC Berkeley, March 26.
- WNYC Radio interview on current cosmological controversies, February 14.

Lecture in UCLA Extension course on Time: "The Beginning and End of Time" January 30.

**1989**

Conference on Low-Background Detectors and Signatures of Dark Matter, UC Berkeley: opening speaker, December 11- 14.

CfPA Conference on Signatures of Dark Matter: Opening talk on "Detection of particle dark matter" December 13.

CfPA Seminar, UC Berkeley: "What Can We Learn from Cluster Correlations?" September 26.

UC Berkeley, Center for Particle Astrophysics seminar: "What Can We Learn from Cluster Correlations", September 26.

Watsonville Rotary Club meeting, Watsonville Elks' Club Lodge, talk on Space Reactor Arms Control, August 16.

Rio conference, session introduction: "Motivations for Studying Nonstandard Fluctuations from Inflation", May 25.

Conference on Large Scale Structure and Streaming Motions in the Universe, Hotel Copacabana Palace, Rio de Janeiro, invited talk: "Cluster Correlations", May 24.

Israel Physical Society Annual Meeting, Plenary Talk, Bar Ilan University: "Dark Matter Detection", April 17.

Weizmann Institute of Science, Rehovoth, Israel, Physics Colloquium: "Dark Matter Detection", April 13

Physics Colloquium, UCSB: "Space Reactors, Gamma-Ray Astronomy, and SDI Arms Control", March 14

Peninsula Astronomical Society, Foothill College, popular talk on dark matter, January 13

**1988**

Invited talk, Conference on Cosmology and Particle Physics, UC Berkeley: "Cluster Correlations", December 9

Workshop on Cosmology and Quantum Gravity, NSF Institute for Theoretical Physics, UCSB; talk, November 28: "Cluster-Cluster Correlations",

UCLA conference, talk: "Orbiting Reactors: Signals and Backgrounds" November 4

Conference on High-Resolution Gamma Ray Cosmology, UCLA, invited talk: "Dark Matter Detection: Overview", November 2

Physics Colloquium, Cal Poly San Luis Obispo: "Dark Matter", October 30.



Observatory, Toravere, Estonia, colloquium: "Dark Matter and Large Scale Structure in the Universe", September 21.

Soviet Space Research Institute (IKI), colloquium: "Dark Matter Detection", September 14.

Steinberg Institute, Moscow State University, cosmology colloquium: "Cluster-Cluster Correlations", September 12.

Aspen Center for Physics, cosmology workshop, seminar: "Status of the Cosmological Constant Problem", June 17.

UCSC Physics Colloquium: "Proposed Ban on Reactors in Orbit", June 2.

Crown College Science Table: "What is the Universe Mostly Made Of?", January 27.

## **1987**

Santa Cruz Astronomy Club monthly meeting, popular talk on cosmology and dark matter, November 19.

Physics Colloquium, Applied Physics Lab, Johns Hopkins University: "Dark Matter and Cosmology", November 6.

Invited lecture, American Physical Society Washington Meeting, Symposium

on The Early Universe: "Cold Dark Matter, Galaxy Formation, and Large

Scale Structure", April 21.

Invited lecture, American Association for the Advancement of Science

Annual Meeting, Chicago, Symposium on Particle Physics and Cosmology: "What Formed the Galaxies and the Immense Galaxy Clusters and Voids?"; also several radio interviews (BBC, DBC, etc.), February 16.

Fermilab Astrophysics Group seminar: "Cold Dark Matter, Galaxy Formation, and Large Scale Structure", February 13.

UCLA Extension course on The Origin and Evolution of the Universe, popular lecture on "The Early Universe and the Role of Dark Matter", January 22

Caltech, Physics seminar on dark matter, January 26.

## **1986**

Co-organizer, Santa Cruz Astrophysics Workshop on Nearly Normal Galaxies, July 21 - August 1.

Director, 3d Theoretical Advanced Study Institute on Elementary Particle Physics (TASI-86), UCSC, June 23 - July 18.

Seminar, Los Alamos National Laboratory, "Particle Candidates for Dark Matter in Galaxy Halos, and the Latest News on WIMPs", April 30.

Seminar, Very Large Array, Socorro, New Mexico, on Dark Matter and Galaxies, April 29.

Invited review lecture, 2nd ESO/CERN Symposium on Cosmology and Fundamental Physics, Garching bei Munchen, "Particle Dark Matter", March 19.

Seminar, Stanford Physics Department, "Cosmic Strings", February 18

Lecture in UCLA Extension Course on Challenging Scientific Problems, on Dark Matter and the Structure of the Universe, February 8

Physics Colloquium, UCSC, "Omega, Dark Matter, and Modern Cosmology", January 30.

Invited talk, Conference on Galaxy Distances and Deviations from Universal

Expansion, Kona, Hawaii, "Dark Matter, Cosmic Strings, and Large Scale Structure", January 15.

## **1985**

Participant, Workshop on Dark Matter, Aspen Center for Physics, August 6-24; invited introductory lecture for the workshop jointly with George Blumenthal), August 7; informal seminar on supersymmetry and WIMPs

Participant, International Astronomical Union Symposium 117, Dark Matter in the Universe", Princeton University, June 24-28.

Popular lecture for UCSC Affiliates, Santa Cruz Library, "Changing Views of the Cosmos", April 2.

Participant, Dark Matter Workshop, Berkeley, March 28-29.

Physics Seminar, University of Washington, "Cold Dark Matter and the Origin of Galaxies", March 20.

## **1984**

Physics Seminar, Brandeis, Cold Dark Matter and the Origin of Galaxies, November 12.

Talk at AAPT of Northern California meeting, UCSC, on Computer Simulations for Teaching Relativity, November 3.

Four Lectures, Enrico Fermi Summer School, Varenna, Italy, "Galaxies and Large Scale Structures for Particle Physicists," June 26-July 3.

Invited Talk, Johns Hopkins Workshop on Particles and Gravity, Baltimore, "Galaxy and Cluster Formation in a Universe Dominated by Cold Dark Matter," June 20.

Invited Talk, Workshop on Early Universe, NSF-ITP, Santa Barbara, "Can Statistics Explain Dressler's Correlation between Galaxy Morphology and Number Density?" June 13.

Inaugural Lecture, UCSC, "Microphysics and the Macrouniverse," May 10.

Theoretical Physics Seminar, Los Alamos National Lab., "Galaxy and Large Scale Structure in a Cold Dark Matter Universe," March 25.

Physics Colloquium, San Francisco State University, "Dark Matter and the Origin of Galaxies, Clusters and Voids," March 19.

Physics Colloquium, NSF-ITP, "Galaxy and Large Scale Structure in a Cold Dark Matter Universe," March 7 (+ follow-up seminar, March 8).

Participant, Workshop on Galaxy Formation, NSF-ITP, Santa Barbara, Jan. 26-28.

Physics Colloquium, Lawrence Livermore Lab., "Dark Matter, Particle Physics and Galaxy Formation," Jan. 24.

## 1983

Physics Colloquium, University of Oregon, "What is the Universe Made Of: Particle Physics and Galaxy Formation," Nov. 17.

Physics Colloquium, Stanford University, "Dark Matter - What is the Universe Made Of?"

Physics Colloquium, UCSC, "What Is the Universe Mostly Made Of?" Oct. 20.

Contributed Talk, Conference on Clusters and Groups of Galaxies, ICTP, Trieste, "Growth of Fluctuations Between Horizon Crossing and Matter Dominance: Implications for Galaxy Formation," Sept. 15.

Invited Talk, First Workshop on Kaluza-Klein Unification, University of Bologna, Italy, "Cosmological Evidence for Dark Matter or Exotic Gravitational Force Law," Sept. 12.

Physics Seminar, University of Rome, "Dark Matter, Particle Physics, and Galaxy Formation," Sept. 9.

Physics Seminar, University of Utrecht, Holland, "Particle Physics of Galaxy Formation," August 10.

Physics Colloquium, Max Planck Institute for Physics and Astrophysics, Munich, "The Particle Physics of Galaxy Formation," July 19.

Physics Seminar, ETH, Zurich, "What is the Universe Mostly Made Of?" July 5.

Physics Seminar, University of Bern, "What is the Universe Mostly Made Of?" July 4.

Physics Seminar, SLAC, "What is the Dark Matter?" May 11.  
Astrophysics Seminar, Max Planck Institute for Astrophysics, Garching, Germany, "What is the Dark Matter?-Implications for Galaxy Formation," June 27.

Invited Talk, 4th Workshop on Grand Unification, University of Pennsylvania, "Dark Matter Galaxies, Superclusters, Voids," April 22.

Invited Talk, Moriand Conferences on Lepton Physics and on Astrophysics, La Plagne, France, "What is the Dark Matter - Implications for Galaxy Formation and Particle Physics," March 14.

Physics Colloquium, UC Berkeley, "What Is the Dark Matter - and Why Does It Matter?" March 7.

## 1982

Physics Seminar, NSF Institute for Theoretical Physics-UCSC  
"Supersymmetry and Cosmology," Oct. 29.

Physics Seminar, SLAC, "Finite Temperature Corrections to Weak Processes and Nucleosynthesis," Sept. 22.

Lectures, Aspen Center for Physics Workshop on the Large Scale Universe, "Introduction to Supersymmetry for Cosmologists," June 10 and 16.

Physics Theory Seminar, Los Alamos National Lab., Gravitinos and Galaxies, May 5.

Physics Theory Seminar, UCLA, "Gravitinos and Galaxies," Feb. 26.

Physics Colloquium, UC Riverside, "Gravitinos and Galaxies," Feb. 25.

Physics Theory Seminar, UC Berkeley, "Gravitinos and Galaxies," Feb. 1.

Physics Seminar, Schlumberger-Doll Research Corporation, Ridgefield, CT, "Gravitinos and Galaxies," Jan. 15.

Physics Seminar, SLAC, "Supersymmetry and Cosmology," Jan. 6.

## 1981

Physics Colloquium, Harvey Mudd College, "Supersymmetry and Cosmology," Dec. 1.

Physics Seminar, New York University, "Supersymmetry, Gravitinos, and the Origin of Galaxies," Nov. 2.

Physics Colloquium, UCSC, "Supersymmetry and Cosmology," Oct. 15; several

lectures on supersymmetry to UCSC high energy theory graduate students and faculty, September-October.

"Testing the Standard Model," American Physical Society Division of Particles and Fields annual conference, UCSC, Sept. 9-11, member of the organizing

committee.

Invited Lecture, Banff Summer Institute on Particles and Fields,  
"Supersymmetry and Cosmology," Aug. 24.

**1980** Physics Colloquium, UCSC, "Monopoles in the Early Universe," Oct. 16.

Physics Seminar, New York University, "Solid State Ideas in Gauge  
Theory Pions as Spin Waves, and Possible Photon Mass at Low  
Temperature," Sept. 22.

Physics Seminar, University of Sussex, Brighton, England, "Gauge  
Symmetry Breaking at Low Temperatures and on the Lattice," Sept. 8.

Physics Seminar, UCSC, "Pions as Spin Waves," May 27.

**1978** Joint lecture series, Ecole Normale Supérieure and University of Paris VI,  
"Review of Monopoles" (a series of 4 lectures by Richard Brandt and Joel Primack),  
June 5, 7, 12, 14.

Guest Lectureship, University of Leuven, Belgium, "Monopoles in  
Electrodynamics and in Nonabelian Gauge Theories" (a series of 8  
lectures), Feb. 7- 10 and May 9-12.

**1977** Physics Seminar, UCI, "Monopoles," Feb. 17.

Dirac Monopole Conference, New York University, "Fermions from  
Bosons with Monopoles," Nov. 18.

Physics Seminar, Los Alamos National Lab, "Spin and Statistics with  
Monopoles," August 18.

Physics Seminar, Aspen Center for Physics, "Classical Action for Charges  
and Monopoles," July 29.

"Secret Seminar," LBL, "Overriding Dirac's Veto," April 14.

Physics Colloquium, U.S. Naval Postgraduate School, Monterey,  
"Monopoles Old and New," April 1.

**1976** Physics Seminar, UCSC, "Overriding Dirac's Veto," Nov. 23.

Physics Seminar, UCSC, "Spin-Statistics Connection for Dyons," Oct. 19.

International Conference on Non-Perturbative Phenomena in Quantum

Field

Theory, CERN, Geneva, invited talk, "Introduction to Monopole

Solutions in

Gauge Theories" and participant in afternoon panel, July 28.

Munich, Physics Seminar, Max Planck Institute for Physics and Astrophysics,

July 22. "Nonsingular Monopole Solutions in Nonabelian Gauge Theories,"

Can Physics Colloquium, Munich Technical University, Garching, "How Far

QED Be Tested," July 7.

Physics Colloquium, UCD, "Monopoles Old and New," May 27.

13. Physics Seminar, UCLA, "'t Hooft Monopole and Generalizations," Feb.

**1975** Research Progress Meeting, LBL, "Theoretical Introduction to Magnetic Monopoles," Nov. 20.

Division of Natural Sciences Colloquium, UCSC, "Properties and Possible Significance of New Particles," Nov. 11.

Third International Workshop on Weak Interactions at High Energies, Columbus, Ohio, "Searching for Neutral Currents with Charged Leptons," Sept. 10.

Third International Workshop on Weak Interactions at High Energies, Columbus, Ohio, "Weak Interactions at Superhigh Energies" (speaker and discussion leader), Sept. 9.

French Physical Society Meeting, Dijon, France, "Psi and Charm Production," July 1.

Physics Colloquium, Max Planck Institute, Munich, "An Introduction to Monopoles in Gauge Theories," June 27.

Conference on Extended Solutions in Field Theory , Ecole Normale Supérieure, Paris, "Integral Equation Techniques for Numerical Solution of Soliton Equations," June 19.

Physics Colloquium, University of Louvain-la-Neuve, "Psi - Data and Theory," June 12.

Physics Colloquium, University of Louvain, Belgium, "An Introduction to Monopoles in Gauge Theories," June 10.

Physics Department Seminar, MIT, "Monopole Solutions in Gauge Theories," May 21.

Physics Seminar, New York University, "Monopole Solutions in Gauge

Theories," May 19.

Physics Seminar, UC Riverside, "Charm," Jan. 17.

**1974** "RPM," Lawrence Berkeley Laboratory, "Charm," Dec. 9.

"Secret Seminar," Lawrence Berkeley Laboratory, "Is the Psi a Ring State?" (with R. Brower), Dec. 9.

Physics Colloquium, San Francisco State College, "What's New in Weak Interactions," Nov. 11.

Physics Colloquium, San Francisco State College, "Introduction to the New Unified Theories of Weak & Electromagnetic Interactions," Nov. 9.

Physics Colloquium, UC Irvine, "Charm," Nov. 5.

Physics Colloquium, UC Irvine, "Current Status of Gauge Theories of Weak Interactions," Oct. 29.

Physics Colloquium, University of Washington, "How to Search for Charm," Sept. 20.

Physics Seminars, Aspen Center for Physics, Gell-Mann workshop on quarks, currents, and gauge theories, "Dirac's and 't Hooft's Magnetic Monopoles" and "The Current Status of Charm," Aug. 13 & 15.

Physics Colloquium, University of Oregon, "Introduction to Gauge Theories of Weak Interactions," Jan. 11.

Physics Colloquium, University of Washington, "Everyman's Guide to Gauge Models of Weak Interactions," Jan. 14.

**1973** Physics Colloquium, UC Berkeley, "The New Theory of Weak Interactions," Nov. 14.

Physics Colloquium, UCSC, "The New Theory of Weak Interactions," Nov. 13.

Summer Schools at UCSC, SLAC, and McGill, Summer 1973 (see publications).

### **Participation in Public Lectures or Forums on Science and Society**

**1992** Participant in MacArthur Foundation Symposium Preserving the Space Environment, University of Chicago; invited lecture: "Protecting the Space Environment for Science", June 25-26.

**1991** Participant, first American Physical Society Congressional Day, April 25.

Organizer and chairman of Symposium on "Protecting the Space Environment" at annual Washington, D.C., meeting of the American Physical Society; invited talk: "Protecting the Space Environment: Overview," April 24.

College of William and Mary Physics Department Colloquium: "Space Reactors, Gamma-ray Astronomy, and Arms Control" April 12.

Session Co-chairman, IGCC Conference on Space and Security, San Diego, Jan.9.

**1990**

Chairman, UCSC Forum on the Weapons Labs, April 12. Berkeley Physics Department Colloquium: "Space Reactors, Gamma-ray Astronomy, and Arms Control," March 7.

UCSC Crown College Science Table: "Protecting the Space Environment" March 6.

**1989**

Stanford Workshops on Political and Social Issues (SWOPSI) 20th Anniversary Celebration, invited speaker on SWOPSI's origins and early years, October 14.

Watsonville Rotary Club talk on Space Reactor Arms Control, August 16.

Hebrew University, Jerusalem, Israel, Physics Colloquium: "Protecting the Space Environment", April.

Physics Colloquium, UCSB: "Space Reactors, Gamma-Ray Astronomy, and SDI Arms Control", March 14.

Physicians for Social Responsibility Annual Meeting, Palo Alto, invited talk on Space Reactor Arms Control, March 10.

UC Institute on Global Conflict and Cooperation, Natural Sciences and Engineering Conference, UC Davis, invited talk on US-Soviet Cooperative Studies on Space Reactor Arms Control, March 3.

American Association for the Advancement of Science Annual Meeting, San Francisco Hilton, invited talk: "Banning Orbiting Reactors"; also several radio interviews, January 18.

**1988**

UCLA Conference on High-Resolution Gamma Ray Cosmology, talk: "Orbiting Reactors: Signals and Backgrounds", November 4

Soviet Space Research Institute (IKI), FAS-CSS Meeting on Banning Orbiting Reactors, participant, September 7-9, overview talk September 8

Soviet Space Research Institute (IKI), Moscow, USSR, FAS-CSS Meeting on US-Soviet Space Cooperation, participant, September 5-6



FAS Congressional Briefing on Space Nuclear Power, Russell Senate Office Bldg Hearing Room, organizer and chairman, July 25.

Colloquium, Stanford Center for Arms Control and International Security: "Verifying a Ban on Orbiting Reactors" Jointly with David Haferneister), July 19.

Scotts Valley Kiwanis Club: "Strategic Defense", May 25 Cambridge University, Cambridge, England, workshop on Protecting the Space Environment, invited presentation on orbiting reactors, July 12-15

National Press Club, Washington D.C., FAS-CSS Press Conference proposing ban on orbiting reactors (background briefer), May 13

**1984** Session organizer, UC Institute on Global Conflict and Cooperation conference on peace research, Asilomar, Nov. 14-16; paper: "Building Transnational Constituencies for World Order"

Invited talk, Mini-conference on Star Wars, NSF-ITP workshop on Early Universe, Santa Barbara, "Teaching About Arms Control and Peace," June 14.

**1983** Radio debate on Nuclear Power with John Gofman and Leonard Sagan, KQED radio, May 9.

**1982** Aptos Assembly - Biblical Adventist Church, participation in panel on the nuclear arms race, Oct. 2.

32nd Pugwash Conference on Science and World Affairs (25th Anniversary), Warsaw, Poland, Aug. 26-31, member, working group on arms control and disarmament, papers: "International Convocation on the Threat of Nuclear War," November 1982 and "The Russell-Einstein Manifesto - and Sakharov."

Scotts Valley Lions Club speaker, "Are Nuclear Power Plants Safe?" Mar. 2.

Science Fiction and Fantasy Conference, UC Riverside, member of panel discussing BBC documentary film "The War Game," Feb. 27.

Lecture, UCLA course CED 118, Energy Alternatives and Public Policy, Daniel Hirsch, instructor, "Energy Conservation," Feb. 24.

Colloquium on Science, Technology, and Society, UCSC, discussant after Charles Perrow's talk, Feb. 3.

Faculty seminar on the implications of recombinant DNA (with Charles Weiner), UCSC, discussant, Jan. 28.

Colloquium, Schlumberger Doll Research Corp., Ridgefield, CT, "The Future of Nuclear Power," Jan. 15.

**1981** Faculty lunch seminar on science, technology, and public policy, Claremont Graduate School, "Advice and Dissent Revisited," Dec. 1; special colloquium series, Harvey Mudd College, "Science and Public Issues: Debate Prematurely Foreclosed?" Dec. 1.

31st Pugwash Conference on Science and World Affairs, Banff, Alberta, Canada, Aug. 27-Sept. 1, member, working group on security in the developing world,

lecture on nuclear proliferation, paper: "A Unilateral Arms Control Measure: Abolition of the U.S. Air Force."

Lunch speaker, Santa Cruz Exchange Club, talk on avoiding nuclear war (with William Epstein), Feb. 4.

**1980** Invited lecturer, Symposium on Scholarly Freedom and Human Rights, Annual Meeting of the British Association for the Advancement of Science, Manchester, England, "Science and Human Rights: Uruguay and the Southern Cone," Sept. 2. BBC Radio and British scientific journalist interviews.

Co-organizer, Public Session, DOE-ACEEE Conference on Energy Efficient Buildings, UCSC, Aug. 22.

Lecture, UCSC Univ. Extension Advanced Course on English as a Foreign Language, "What's Wrong with Breeder Reactors," July 17; repeated Nov. 5.

Radio interviews on nuclear reactor safety with several local stations, a syndicated radio program, and station CHUM in Toronto, Canada, May 13.

Lecture in Symposium at Stanford Medical School on The Medicine of Acute Radiation Exposure, April 12: "Scenario: A Meltdown Accident in a Large Nuclear Power Plant."

Lecture at Naval Postgraduate School, Monterey, March 7, "Science, Technology & Politics."

Principal Speaker, Forum on "The Effects of Limited Resources on Our Energy & Ecology in the 1980's," sponsored by Yavi College and the Arizona Humanities Council, Prescott, Arizona, Feb. 25.

Invited Lecture, Annual Meeting of the APS, Chicago, Jan 23: "The Three Mile Island Accident: A Critical Perspective."

Chairman, Symposium: "What Special Rights and Responsibilities Do Scientists and Engineers Have?" and Chair, Business Meeting of the Clearinghouse on Science & Human Rights, Annual Meeting of the American Association for the Advancement of Science, San Francisco, Jan. 4.

**1979**

Lecture at General Research Corp., Santa Barbara, Dec. 12, Lectures: "Nuclear Power."

Forum on "Our Energy Future" sponsored by the Loma Prieta Chapter of the Sierra Club, SLAC Auditorium, Nov. 8 - talk on nuclear energy and conservation.

UCSC Course ES 1, taught by Robert Curry, Oct. 30, lecture on scientists & nuclear policy issues.

Philips Fund Distinguished Visitor, Haverford College; lectures Sept. 19, "Technology in a Democracy" (with Nancy Abrams) and Sept. 20, "Technological & Political Implications of the Three Mile Island Accident."

San Diego Natural History Museum, participant in debate on nuclear energy sponsored by the San Diego Chapter of the Sierra Club, June 22.

Student Pugwash Conference, UC San Diego, Plenary Session on Science and Politics, speaker on "Technology in a Democracy," June 21.

UCSC course on Environmental Law (ES 143), taught by Gerald Bowden, talk on scientists and politics, especially nuclear issues.

Forum on "Science and Your Responsibility," Oakes College, UCSC - talk: "Advice and Dissent: Scientists in the Political Arena," May 21.

Chairman, Workshop of the AAAS Clearinghouse on Scientific Freedom and Human Rights, Brookings Institution, Washington, D. C., May 10.

Lecture at Crown College, UCSC, "Implications of the Three Mile Island Accident" (with D. Dorfman), May 3.

Moderator, "The Great Debate" (on U.S. strategic weapons policy and the weapons labs), UCSC Quarry, Apr. 21.

Physics Colloquium, UCSC, "The Implications of the Three Mile Island Accident" (with D. Dorfman), Apr. 17.

Balancing Acts: Explorations in Decision Making, San Francisco Exploratorium, participation in symposium on Environmental Planning, Apr. 10. (Broadcast May 7 by KPFA, Berkeley.)

Radio interviews on reactor safety and the Three Mile Island accident:

KZSC (Santa Cruz), Mar. 30; KFAT (Gilroy) and KPFA (Berkeley), Apr. 5; WPLJ (ABC-FM, New York), Apr. 8 and May 12.

Oakes College Science Table speaker (with Nancy Abrams) on the 1978 Pugwash Conference, Jan. 31.

Co-organizer, Symposium on Scientific Freedom and Responsibility in the International Arena, AAAS Annual Meeting, Houston, Texas, Jan. 5.

**1978** Physics Colloquium, Cal State Sacramento, "Scientists and the Politics of Nuclear Power, Dec. 7.

UCSC rally, talk about UC weapons labs and the Comprehensive Text Ban Treaty, Nov. 15.

UCSC course, Environmental Issues (ESI), taught by Paul Niebanck, Nov. 28, lecture on scientists and nuclear issues.

28th Pugwash Conference on Science and World Problems, Varna, Bulgaria, talks on "Better Alternatives to Plutonium Recycling and the Fast Breeder Reactor" and "A U.S. View of Scientific Freedom in the International Arena," Sept. 1-5.

AAAS Annual Meeting, Washington, D.C., Feb. 17, Symposium on Human Rights and Scientific Freedom, "The AAAS Committee's Experience: the Situation in Argentina as an Example."

**1977** Lecture in Stanford Law School course, taught by John Barton, "Scientific Freedom and Human Rights," Dec. 13.

Science and Society Colloquium, UC Santa Barbara, "Advice and Dissent: Scientists in the Political Arena," Dec. 11.

UCSC Class on Natural Resources (ES. 22), taught by Dick Cooley, "U.S. Electricity Supply and Demand," Nov. 2.

Oct. 14. Santa Cruz chapter of the Sierra Club, "Do We Need Breeder Reactors,"

Co-organizer, AAAS Workshop on Human Rights and Scientific Freedom, Washington, D.C., June 6.

UCSC course on Energy Alternatives, taught by Peter Scott, "Nuclear Energy Issues," May 25.

Moderator, Scientists' Institute for Public Information Annual Meeting, Washington, D.C., April 29.

Physics Colloquium, UCI, "New Developments in Science Policy," Feb. 18.

**1976** Lecture in Stanford University undergraduate seminar taught by Perry Wilson, "Advice and Dissent: Scientists in the Political Arena," Nov. 9.

UCSC class on Natural Resources (ES. 22), taught by Dick Cooley, "U.S. Electricity Supply and Demand," Oct. 27.

Graduate Student Seminar, UCSC, talk on reactor safety, June 1.

Symposium of the Science-Humanities Convergence Program on "Science, Education, and Public Policy," Cal. State University, San Francisco: presented talk on "Public Interest Science in the Classroom" and participated in panel (with Gerald Holton, Theodore Roszak, and Jacob Needleman), May 6.

Meeting of the Sons in Retirement, Santa Cruz chapter, luncheon talk on the California Nuclear Initiative. Apr. 7.

Physics Colloquium, Cal. State University, San Jose, "Nuclear Reactor Safety," March 19.

Cabrillo College energy seminar series, "Nuclear Safety," March 15.

Meeting of the Rotary Club of Scotts Valley, luncheon talk on the California Nuclear Initiative, March 15.

Hearing on National Science Foundation Authorization Legislation for 1976, US Senate Committee on Labor and Public Welfare, Special Subcommittee on the NSF, "Federal Support for Public Interest Science: NSF's Science for Citizens Program," March 3. (At the request of Sen. Kennedy, who chairs the NSF subcommittee, I organized and participated in a panel to testify on Science for Citizens Program.)

Physics Colloquium, UCLA, "Nuclear Reactor Safety," Feb. 12.

Meeting at Stanford Physics Department of San Francisco Bay Area Junior college physics teachers, organized by Walter Meyerhof and Jean Fetter, "Public Interest Science in the Classroom," Jan. 17.

## **1975**

Crown College student-organized discussion on nuclear reactor safety, Nov. 20.

UCSC class on Land and Resources Law (ES 144) taught by Jerry Bowden, talk on nuclear energy issues, Nov. 18.

Stanford University/Lilly Foundation Program for Faculty Renewal "Revolutions in Physics" Conference for Physics Teachers, "Nuclear Reactor Safety," Palo Alto, California, Nov. 9. (I also moderated a debate between Michael Peevey, director of California Council for Environmental and Economic Balance, and David Pesonen, author of California Nuclear Initiative.)

TV interview on California Nuclear Initiative, station KVIA, Sacramento (for California educational TV stations), Sept. 24.

International Conference on Environmental Sensing and Assessment, Las Vegas, "Public Interest Science," Sept. 16.

Physics Department Special Seminar, Princeton University, "Nuclear Reactor Safety," May 12.

Physics Colloquium, Rockefeller University, "Nuclear Reactor Safety," May 7.

Seminar, Carleton College, "Advice and Dissent: the SST," May 2.

Physics Colloquium, Carleton College, "Nuclear Reactor Safety," May 1.

American Physical Society Meeting, Washington, D. C., Organizer, Symposium on Nuclear Reactor Safety, April 30.

Seminar, MIT, Center for Science and Society, Public Interest Science, April 8.

23rd National Convention, National Science Teachers Association, Los Angeles, "The Nuclear Reactor Safety Controversy," March 21.

American Physical Society Annual Meeting, Anaheim, "Advice and Dissent: Teaching About Political Activities of Scientists," Jan. 31.

American Physical Society Annual Meeting, Anaheim, Panel on APS Public Activities (with M. Casper, W. K. H. Panofsky), Jan. 29.

Physics Colloquium, UC Riverside, "Public Controversies on Technical Issues: Nuclear Safety," Jan. 16.

## **1974**

Session of AAAS Annual Meeting, San Francisco, "Scientists in the Public Interest" (session of "The Role of Professional Societies in Meeting Environmental Problems"), March 1.

AAAS Annual Meeting, San Francisco, organizer and chairman of symposium, "Independent Scientists and the Energy Crisis," Feb. 27.

SLAC Energy Seminar, SLAC, "Primer on Nuclear Fission: Facts and Issues," Feb. 19.

Physics Department Seminar, University of Washington, "Progress Report on Nuclear Reactor Safety," Jan. 15.

TV Interview on Energy (with Peter Scott), Santa Cruz cable TV station, Jan.

**1973**

Conference on Scientists in the Public Interest: The role of Professional Societies (sponsored by the American Academy of Arts and Scientists, Western Center, and the University of Utah, Alta, Utah; co-organizer of the Conference, chairman of two sessions and of a task force, editor or author of reports of the Report of the Conference (available from the Physics Department, University of Utah). (Note: the June 1974 special issue of *Physics Today* on "Public Interest Science" was a direct outgrowth of this conference.) Sept. 7-9. American Physical Society Meeting, Berkeley, chairman of session on "Energy," Dec. 27.