

*Professional Activities of*  
**Andreas Albrecht**

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Invited Talks at Major Meetings

1. **Inflation 1984**, *Fifth Workshop on Grand Unification* Providence RI, April 1984.
2. **Particle Physics Turns to Cosmology**, *Meeting of the AAAS*, Los Angeles, May 1985.
3. **Cosmic String Evolution**, *Aspen Winter Conference*, Aspen CO, January 1986.
4. **Evolution of Cosmic Strings: Possible Seeds of Galaxies**, *Spring Meeting of the APS*, Washington DC, April 1986.
5. **Formation and Evolution of Cosmic Strings**, *Nearly Normal Galaxies: From the Planck Time to the Present*. Santa Cruz CA, 1986.
6. **Cosmology for high-energy physicists**. Lectures presented at *the Theoretical Advanced Studies Inst.*, Santa Fe, NM, Jul 5 - Aug 1, 1987.
7. **New simulations of cosmic string evolution**, *Cosmic Strings: the Current Status* New Haven, CT May 6-8, 1988.
8. **Cosmic String Review** *CITA Computing Cosmologies Workshop*. Toronto, Ont. April 28-29, 1989.
9. **Small scale structure on cosmic strings**. *Formation and Evolution of Cosmic Strings*, Cambridge, Eng., Jul 2-7, 1989.
10. **Density perturbations from cosmic strings: Can you see the strings above the noise?** *First International Symposium on Particles, Strings, and Cosmology*, Boston, MA; March 27-31, 1990.

11. **The Zeldovich spectrum, from scaling arguments to computer Simulations ...and back again** *Workshop on the Legacy of Ya. B. Zeldovich for Astrophysics and Cosmology*. Lawrence Kansas; May 2-7, 1990.
12. **The Emergence of Classical Behavior** *UBC Workshop on Quantum Cosmology*, Vancouver BC; May 11-12, 1990.
13. **Perturbations from Strings Dont Look Like Strings!** *Particles and Fields 91*, Vancouver BC; August 18-22, 1991.
14. **Two perspectives on a decohering spin** *Workshop on the Physical Origins of Time Asymmetry* Mazagon Spain, September 30 to October 4 1991.
15. **Structure formation with cosmic strings and neutrinos** *The Many Aspects of Neutrino Physics* Fermilab, November 15-17, 1991.
16. **Cosmic structure from cosmic strings** *Theoretical Trends in Particle Physics* sponsored by the Institute of Physics. Kings College London, June 11, 1993.
17. **Dark mater and structure formation** *Dark Matter Workshop*. Imperial College, December 9, 1993.
18. **Quantum Cosmology and Astrophysics** *Birth of the Universe and Fundamental Forces*. Rome, May 18-21, 1994.
19. **Current status of cosmic strings** *American Physical Society DPF meeting on future directions in particle cosmology*. Snowmass CO, July 1994.
20. **Inflation and squeezed quantum states** *American Physical Society DPF meeting on future directions in particle cosmology*. Snowmass CO, July 1994.
21. **The theory of everything vs the theory of anything.** *American Physical Society DPF meeting on future directions in particle cosmology*. Snowmass CO, July 1994.
22. **Coherence and Sakharov Oscillations in the Microwave Sky Microwave Background Anisotropies.** *XXXIst Rencontre de Moriond, Microwave Background Anisotropies* Les Arcs March 1996
23. **Defect Signatures in the Microwave Background** *National Astronomy Meeting*. Liverpool. April 1996
24. **How to falsify scenarios with primordial fluctuations from inflation** *Critical Dialogues in Cosmology: Princeton 250th Anniversary conference*, Princeton, June 1996.

25. **Questions and answers about coherence in the CMB** *18<sup>th</sup> Texas Symposium on Relativistic Astrophysics*. Chicago, December 1996.
26. **Defects and the CMB** *Particle Physics and the Early Universe Conference*. University of Cambridge, April 1997
27. **Cosmic defects and the CMB** *Birth of the Universe II* Rome, May 1997
28. **What is the future of causal models of cosmic structure?** *Cosmo- 97*, Ambleside, September 1997
29. **The cosmic defect story** Review talk at the *1998 Moriond meeting: Fundamental Parameters in Cosmology*, Les Arcs January 1998
30. **New paradigms in active structure formation** *CAPCC 98*, CERN, June 1998
31. **Cosmology with a time varying speed of light** *Cosmo-98*, Asilomar 1998
32. **Cosmology with a time varying speed of light** *19<sup>th</sup> Texas meeting on relativistic Astrophysics* Paris, December 1998
33. **Varying speed of light as a solution to cosmological problems** *Pritzker Symposium Workshop* Chicago, January 1999
34. **What have cosmic defects taught us about Inflation?** *Pritzker Symposium Workshop* Chicago, January 1999
35. **The use of probabilities in cosmology.** *Inner Space/Outer Space II, David Schramm memorial symposium* Fermilab, May 1999
36. **The current status of defect models of structure formation.** *Inner Space/Outer Space II, David Schramm memorial symposium* Fermilab, May 1999
37. **Irreversibility: from bit to bang.** *Workshop on Complexity, Computation, and the physics of information*. Isaac Newton Institute, Cambridge, July 1999
38. **Review of Cosmic Inflation.** *NATO advanced studies institute on Cosmology*. Isaac Newton Institute, Cambridge, July 1999
39. **Cosmic Coherence and structure formation.** *NATO advanced studies institute on Cosmology*. Isaac Newton Institute, Cambridge, July 1999
40. **A phenomenology of the dark energy without fine tuning.** *NATO advanced studies institute on Cosmology*. Isaac Newton Institute, Cambridge, July 1999

41. **Phenomenology of a realistic accelerating universe using only Planck-scale physics.** *COSMO 99*. Trieste September 1999
42. **Cosmic Acceleration and the Planck Scale** *Cosmic Genesis and Fundamental Physics* Sonoma October 1999
43. **Cosmology with a time-varying speed of light** *Cosmic Genesis and Fundamental Physics* Sonoma October 1999
44. **Cosmic Defects and the future of cosmology** *Cosmic Genesis and Fundamental Physics* Sonoma October 1999
45. **Current Status of Defect models of Cosmic Structure Formation** *PASCOS 99* Granlibakken (December 1999)
46. **Cosmic Acceleration from Planck-Scale physics** *Energy Densities in the Universe* Les Arcs, France (January 22-29, 2000)
47. **Using Cosmological Data to Pin Down Planck-Scale Physics** *Way beyond the standard models of particle physics and cosmology*, Aspen (Jan-Feb 2000)
48. **Opportunities to expose the nature of the dark energy with future CMB and  $m(z)$  experiments** *Texas Symposium on Relativistic Astrophysics* Austin (Dec 2000)
49. **Characterizing Models of the Dark Energy with SNAP.** *197th Meeting of the American Astronomical Society* San Diego (January 2001).
50. **Cosmic Acceleration and Fundamental Physics.** *PASCOS 2001* Chapel Hill (April 2001)
51. **Latest Developments in Cosmology.** *PHENO 2001 Symposium* Madison (May 2001).
52. **Natural quintessence from large extra dimensions.** *M Theory Cosmology*, Cambridge UK (August, 2001)
53. **The arrow of time, entropy, and the origins of the Universe.** *Symposium in honor John Wheeler's 90<sup>th</sup> birthday*, Princeton (March 2002)
54. **Cosmic Acceleration: Theory and Practice.** *APS Division of Particles and Fields annual meeting*, Williamsburg VA (May 2002)
55. **Models of Cosmic acceleration.** *COSMO-02*, Chicago (September 2002)
56. **Inflation, the arrow of time, and theories of initial conditions.** *Maryland meeting on Cosmic Structure*. University of Maryland, (October 2002)

57. **Introduction to the debate on inflation and alternatives.** National Academy of Sciences Colloquium on Cosmology, Irvine (November 2002) [Albrecht was the moderator of the debate]
58. **Testing Inflation: The next generation.** Carnegie Observatories Centennial Symposium No. 2 "Measuring And Modeling The Universe". Pasadena, CA (November 2002)
59. **Inflation at 22.** The Davis Meeting on Cosmic Inflation, Davis CA (March 2003)
60. **Cosmic acceleration and fundamental physics.** April APS meeting, Philadelphia, PA, 2003
61. **What does it take to compete with inflation?** "The Future Of Cosmology", Oct 10-12, 2003, CWRU, Cleveland, OH
62. **Inflation and Causal Patch Physics** "Superstring Cosmology" (Oct 20-24, 2003) KITP, Santa Barbara, CA (see <http://online.kitp.ucsb.edu/online/strings03/> for slides and video from talk)
63. **Can the universe afford inflation?** "The Quest for Concordance Cosmology and Beyond" (July 4-17, 2004)
64. **Report from the Dark Energy Task Force** April APS Meeting, Dallas (April 22-25, 2006)
65. **Report from the Dark Energy Task Force** "From Quantum to Cosmos", Airlie, VA (May 22-24, 2006)
66. **Strategies for Learning the Nature of Dark Energy** April meeting of the American Astronomical Society (Calgary, June 4-8 2006)
67. **Current perspectives on Dark Energy Theory** "Particles Strings and Cosmology (PASCOS) (Columbus, September 10-15, 2006)
68. **Probing the Nature of Dark Energy** "The Origins of Dark Energy" (Hamilton Ontario May 2007)
69. **Current Status of Theories of Dark Energy** "Particles Strings and Cosmology" (PASCOS) (London, UK July 2007)
70. **The Clock Ambiguity and the Emergence of Physical Laws** "Everett at 50" (Oxford, UK, July 2007)

71. **The Clock Ambiguity and the Emergence of Physical Laws** “The Origin of Time’s Arrow” (New York, October 2007)
72. **What can we learn from future dark energy probes?** “STSI Spring Symposium” (Baltimore, 2008)
73. **The Clock Ambiguity and the Emergence of Physical Laws** “Conference on the Multiverse” (Perimeter Institute, September 2008)
74. **The Clock Ambiguity and the Emergence of Physical Laws** “DICE2008 - From Quantum Mechanics Through Complexity to Spacetime: The Role of Emergent Dynamical Structures” (Castiglioncello, Tuscany, September 2008)
75. **Report from the Joint Dark Energy Mission Figure of Merit Science Working Group** “APS April Meeting” (Denver, May 2009)
76. **Dark Energy: Current Status** “PASCOS 2009” (Hamburg, July 2009)
77. **Challenges for a quantum theory of the Universe** FQXI 2<sup>nd</sup> International Conference (Ponta Delgada, Spain, July 2009)
78. **Challenges for a quantum theory of the Universe** Perimeter Institute Conference on Holographic Cosmology (Waterloo, July 2009)
79. **Cosmic Acceleration: Current theoretical issues and progress toward future observations** Galileo-Xu Guangqui Meeting (Shanghai, October 2009)

#### Meetings Organized/Convened

1. COSMO 06 September 25-29 2006, Lake Tahoe, CA (member of organizing committee).
2. Nobel Symposium on String Theory and Cosmology August 14-19 2004 Sigtuna, Sweden (convener of session on inflation)
3. The Davis Meeting on Cosmic Inflation. March 2003 (Chair of organizing committee)
4. Snowmass 2001 Co-convener of the Early universe cosmology and tests of fundamental physics section.
5. PASCOS 1999, Lake Tahoe, December 1999 (co-organizer)

6. *Cosmic Genesis and Fundamental Physics* Sonoma 1999 (session convener)
7. *Workshop on analysis of large astronomical data sets*. Isaac Newton Institute, Cambridge, August 1999. (co-organizer)
8. *Programme on Complexity, Entropy, and the Physics of Information*. Isaac Newton Institute, Cambridge, May-August 1999. (co-organizer)
9. *Early Universe Session.. Inner Space/Outer Space II* David Schramm memorial symposium, May 1999. (session organizer)
10. *Symposium on Gauge Theory, Cosmology, and Fundamental Physics* London, July 1998 (Co-organizer and Member of the Science Committee)
11. *The Eighteenth UK Institute for Theoretical High Energy Physicists* St Andrews, 1997 (Member of Scientific Committee)
12. *Imperial College international CMB workshop* London April 1997. (principle organizer)
13. *Defect CMB Workshop*, DAMTP, Cambridge, Feb 1996 (co-organizer)

### Workshop participation

In addition to the large meetings listed above, I have been active in numerous informal workshops of international standing. For example, below I list such activities covering 1996-2003. In each case participation was by invitation only, and my contributions included presenting talks and other activities.

1. *Defect CMB Workshop*, DAMTP, Cambridge, Feb 1996 (co-organizer).
2. *IC CMB Workshop*, Imperial College, London April 1997 (Principle Organizer).
3. *Workshop on Structure Formation*. Aspen Center for Physics, Aspen, June 1997
4. *The Sloan Summit On Microwave Foregrounds* Institute for Advanced Study November 14-15, 1998
5. *Santa Fe Workshop on Cosmology*. Santa FE NM, July 1999
6. *Aspen Workshop on large extra dimensions*. August 2000
7. *Aspen Workshops on String Theory and Cosmology* August 2002
8. *New Horizons in String Cosmology* Banff Research Station, June 2004
9. *Aspen Workshop on Wide Fast Deep Surveys: New Frontier for Cosmology* June 2009
10. *Aspen Workshop on Testing General Relativity in the Cosmos* June 2009
11. *Perimeter Institute Workshop on Holographic Cosmology* July 2009

### Service on Key Panels and Committees

1. *ASTRO 2010 Decadal Survey Particle Astrophysics and Gravity subcommittee* (2009-2010)
2. *Joint Dark Energy Mission Figure of Merit Science Working Group* (DoE/ESA/NASA) 2008
3. *Kavli Institute for Cosmological Physics External Advisory Board* (University of Chicago) 2007-present

4. Particle Physics Project Prioritization Panel (P5) 2005 - 2007
5. Astronomy and Astrophysics Advisory Committee and the High Energy Physics Advisory Panel “Dark Energy Task Force” 2005 – 2006
6. Director’s physics division review panel member, Lawrence Berkeley Laboratory, November 2005
7. SLAC program DOE review panel (2005)
8. NASA/DOE “Joint Dark Energy Mission Science Definition Team” 2004 – 2006.
9. DOE review panel member, Review of Lawrence Berkeley Laboratory High Energy Physics program. Feb 2004
10. NSF Particle Theory grant review panel (Jan 2004)
11. High Energy Physics Advisory Panel (HEPAP) Quantum Universe Committee (Nov 2003- June 2004) <http://interactions.org/quantumuniverse/>
12. UCD Faculty advisory panel member for the recruitment of a new Dean of Mathematical and Physical Sciences. (Spring 2003)
13. DOE SNAP Lehman review panel. (July 2002)
14. NSF Astronomy grant review panel (March 2001)
15. *Committee on the International Freedom Of Scientists* (of the American Physical Society) 2000-2002.
16. *Particle Physics Theory Committee* (PPTC). of the panels for the Particle Physics and Astronomy Research Council (PPARC) (Assesses theoretical particle physics grants) 1996-1998 (UK)
17. *Theoretical Research Assessment Panel* (TRAP). of the panels for the Particle Physics and Astronomy Research Council (PPARC) (Assesses theoretical astronomy grants) 1996-1998 (UK)
18. *Joint Astronomy and Particle Physics Supercomputer panel* (JAPPS) (Plans PPARC supercomputing strategy). 1995-1998 (UK)

Computing Initiatives

1. Co-author of the Physics department document proposing the physics department's role in a campus-wide UC Davis computing initiative. 1999
2. Co-investigator in the *Fundamental Physics Consortium* providing Supercomputing resources for new projects in Cosmology and Quantum Field Theory. UK 1998
3. Founding Co-investigator and project manager for the UK Cosmology Computing Consortium (A dedicated UK cosmology supercomputing facility) 1996-1998

### Public Outreach

My colleagues and I energetically advocate cosmology as a showcase field in order to generate wider public understanding of basic research. This has resulted in increased support for cosmology at all levels. My direct personal efforts at communicating with the wider public include:

1. Numerous interviews with the media (see [http://www.physics.ucdavis.edu/Cosmology/albrecht/in\\_the\\_media.htm](http://www.physics.ucdavis.edu/Cosmology/albrecht/in_the_media.htm))
2. Consultant for the Big Bang exhibit at the National Museum for Science and Industry in London (opened Sep 1996).
3. Frequent lectures to school students and other interested members of the public. (see <http://www.physics.ucdavis.edu/Cosmology/albrecht/Public-Lectures.html> for recent examples)