

# Curriculum Vitae

## Personal

Name Tom Abel  
Date of Birth September, 3rd 1970  
Present Address Kavli Institute for Particle Astrophysics and Cosmology, Stanford  
2575 Sand Hill Road, MS 29, Menlo Park, CA 94025  
Email [tabel@stanford.edu](mailto:tabel@stanford.edu)  
<http://tomabel.org>  
Citizenship German  
Marital Status Married. One child, Patrick, born (11/2005)  
Languages: Bilingual in German and English

## Education and Employment

1988-1989 Fachhochschule Isny, general physics  
1989-1990 Fachhochschule München, technical physics  
1990-1998 University of Regensburg, physics (Masters degree)  
Thesis: Molecular Hydrogen and the very first Light in the Universe  
(adv. M.L. Norman and U. Krey)  
7/1996-6/1999 Visiting Research Scholar at the National Center for Supercomputing  
Applications at Urbana/Champaign  
1/1997-9/1999 Visitor, Max Planck Institute for Astrophysics Garching/Germany  
6/1999 PhD at the Ludwig Maximilians University Munich  
Thesis: *The First Structures in the Universe, A Theoretical Study of their  
Formation, Evolution and Impact on Subsequent Structure Formation*  
(adv. Simon D.M. White and Michael L. Norman)  
10/1999-6/2001 Postdoctoral Fellow, Harvard College Observatory, Cambridge, US  
6/2001-12/2001 Postdoctoral Researcher, Institute of Astronomy, Cambridge, UK  
8/2001-10/2001 Wempe Lecturer, Astrophysical Institute Potsdam, Germany  
1/2002 Assistant Professor, Dept. for Astronomy and Astrophysics,  
The Pennsylvania State University, University Park, PA  
7/2004 Associate Professor with tenure, Dept. for Astr. and Astrophysics, Penn State  
10/2004- Associate Professor Department of Physics and Kavli Institute for Particle  
Astrophysics and Cosmology, Stanford University, and SLAC  
6/2005 Founding Head of the KIPAC Computational Physics department at SLAC  
2010-2011 Visiting Professor at the University of Heidelberg at Institute for Theoretical  
Astrophysics and the Heidelberg Institute of Theoretical Studies  
8/2013- Director, Kavli Institute for Particle Astrophysics and Cosmology,  
Stanford/SLAC

## Teaching Experience

1990-1992 Lecturer at the Berufsbildungszentrum Regensburg in introductory  
Math, Astronomy, Ecology, Biology, and Computer Science for a  
reintegration program for the longterm unemployed.  
1990-1994 Tutoring from high-school to university level mostly in math and physics  
1993-1994 Teaching Assistant, department of mathematics, University of Regensburg,  
300 level classes in calculus and linear algebra  
2002 - 502 Theoretical Astrophysics, for 10 graduate students  
Graduate Seminar: The high redshift Universe 7 students  
2003 AST1 The Astronomical Universe, Spring 220, Fall 330 students  
2004 497 Special Topics: Structure Formation in the Universe, 11 students  
2005 Phys 16: Cosmic Horizons, 40 students  
Physics 463: Experimental Cosmology with Steve Allen, 5 students  
2006/07 Phy 18: Seminar: Revolutions in the Concept of the Cosmos (5 students)  
Phy 360: Graduate course: Physics of Astrophysics (3 students)

2007/08/09/10	Phy 41N: Mechanics, ~ 15 students Phy 17: Black Holes, ~ 60 students (each time) AST 16: The Observed Universe and how it came to be this way (cont. ed.)
2011	Research Opportunities at Stanford for graduate students.
2012	Phy 211: Continuum Mechanics for graduate students (12 students)
2013	Phy 113: Computational Physics for advanced undergraduates (8 students) Phy 211: Continuum Mechanics for graduate students (17 students)
2014	Phy 113: Computational Physics for advanced undergraduates (10 students)

### Computing Skills and Experience

20 years of parallel computing with MPI and openMP on (Cray YMP, SGI ORIGIN, SGI Altix, IBM SP2 and wide range of clusters Linux/Mac OS)

Programming Languages: IDL, Fortran77, Mathematica, C, C++, Basic, Pascal, Python, PHP, Julia

Operating Systems: various UNIX dialects, Windows, Mac OS X

Acquired and operated computers:

52 processor beowulf assembled from parts and operated for three years at PSU (2002-2004)

72 processor SGI Altix with 440Gb ram and 10 Tb disk: 1/2005-2010

800 core AMD opteron based system, 3 Tb of ram with 40 Tb of lustre fs: since 5/2007

1024 core Cray XT3 since 2010

### List of Publications

peer reviewed: Citations ~10000, h-index ~ 50, g-index ~ 90, i10 index: 84

[According to Google scholar]

### peer reviewed accepted or published:

102. Oliver Hahn, Raul Angulo & **Tom Abel** 2014, The Properties of Cosmic Velocity Fields, MNRAS, submitted.

101. John H. Wise, Vasiliv G. Demchenko, Martin T. Halicek, Michael L. Norman, Matthew Turk, **Tom Abel**, Britton Smith 2014, The Birth of a Galaxy - III. Propelling reionisation with the faintest galaxies, MNRAS in press.

100. Raul Angulo, Rhuizhu Chen, Stefan Hilbert & **Tom Abel** 2013, Noiseless Gravitational Lensing Simulations, MNRAS, accepted.

99. Ji-Hoon Kim, **Tom Abel**, Oscar Agertz, et al. (+43 co-authors) 2014, The AGORA High-resolution Galaxy Simulations Comparison Project, ApJS, 210, 14

98. Hide Yajima, Yuexing Li, Qirong Zhu, **Tom Abel**, Caryl Cronwall, Robin Ciardullo 2014, Escape of Ly $\alpha$  and continuum photons from star-forming galaxies, MNRAS, 440, 776.99. Tony Y. Li, Marcelo Alvarez, Risa Wechsler & **Tom Abel** 2013, Reionization Histories of Milky Way Mass Halos, ApJ, 785, 11.

97. Greg Bryan, Michael L. Norman, Brian O'Shea, **Tom Abel** (+24 co-authors) 2013, Enzo: An Adaptive Mesh Refinement Code for Astrophysics, ApJS, 211, 19.

96. Raul Angulo, Oliver Hahn & **Tom Abel** 2013, The Warm DM halo mass function below the cut-off scale, accepted to MNRAS

95. Raul Angulo, Oliver Hahn & **Tom Abel** 2013, How closely do baryons follow dark matter on large scales?, MNRAS, 434 1756.

94. Oliver Hahn, **Tom Abel**, Ralf Kaehler 2013, A new approach to simulating collisionless dark matter fluids, MNRAS, 434, 1171.

93. Ji-hoon Kim, Mark Krumholz, John Wise, Matthew Turk, Nathan Goldbaum, **Tom Abel** 2013, Dwarf Galaxies with Ionizing Radiation Feedback. II: Spatially-resolved Star Formation Relation, ApJ 779, 8.

92. Ji-hoon Kim, Mark Krumholz, John Wise, Matthew Turk, Nathan Goldbaum, **Tom Abel** 2013, Dwarf Galaxies with Ionizing Radiation Feedback. I: Escape of Ionizing Photons, ApJ 775, 109.

91. Jedamzik, Karsten & **Tom Abel** 2013, Weak Primordial Magnetic Fields and Anisotropies in the Cosmic Microwave Background Radiation, JCAP, 10, 50.

90. Hide Yajima, Yuexing Li, **Tom Abel**, Cold accretion in early galaxy formation and its Lyman-alpha signatures, *ApJ*.
89. Ralf Kaehler & **Tom Abel** 2012, Single-Pass GPU-Raycasting for Structured Adaptive Mesh Refinement Data, accepted to Visualization and Data Analysis 2013.
88. Ralf Kaehler, Oliver Hahn & **Tom Abel** 2012, A Novel Approach to Visualizing Dark Matter Simulations, *IEEE VGTC*, Volume 18
87. Ralf Kaehler & **Tom Abel** 2012, Interactive Stereoscopic Visualization of Large-scale Astrophysical Simulations, *Stereoscopic Displays and Applications XXIII*. Edited by Woods, Andrew J.; Holliman, Nicolas S.; Favallora, Gregg E. Proceedings of the SPIE, Volume 8288, pp. 82882O-82882O-8.
86. John H. Wise, **Tom Abel**, Matthew J. Turk, & Michael L. Norman 2012, The Birth of a Galaxy: II The Role of Radiation Pressure, *MNRAS*, 427, 311.
85. Marcelo Alvarez & **Tom Abel** 2012, The Effect of Absorption Systems on Cosmic Reionization, *ApJ*, 747, 126.
84. Matthew J. Turk, Jeffrey S. Oishi, **Tom Abel** & Greg Bryan 2012, Magnetic Fields in Population III Star Formation, *ApJ*, 745, 154.
83. John H. Wise, Matthew J. Turk, Michael L. Norman & **Tom Abel** 2012, The Birth of a Galaxy: Primordial Metal Enrichment and Stellar Populations, *ApJ*, 745, 50.
82. Hide Yajima, Yuexing Li, Qirong Zhu, **Tom Abel**, Caryl Cronwall, Robin Ciardullo 2012, Were progenitors of local  $L^*$  galaxies Lyman-alpha emitters at high redshift?, *ApJ*, 754, 118.
81. **Tom Abel**, Oliver Hahn & Ralf Kaehler 2012, Tracing the Dark Matter Sheet in Phase Space, *MNRAS*, 427, 61.
80. Hide Yajima, Yuexing Li, Qirong Zhu & **Tom Abel** 2012, ART<sup>2</sup> : Coupling Lyman-alpha Line and Multi-wavelength Continuum Radiative Transfer, *MNRAS*, 424, 884.
79. Ji-hoon Kim, John H. Wise, Marcelo Alvarez & **Tom Abel** 2012, Galaxy Formation with Self-consistently Modeled Stars and Massive Black Holes. I. Feedback-regulated Star Formation and Black Hole Growth, *ApJ*, 738, 54.
78. Tafelmeyer, M et al. 2011, Extremely Metal-poor Stars in Classical Dwarf Spheroidal Galaxies: Fornax, Sculptor, and Sextans, *A&A*, 527, 1.
77. Alexei Kritsuk, Aake Nordlund, David Collins, Palo Padoan, Michael L. Norman, **Tom Abel**, Robi Banerjee, Christoph Federrath, Mario Flock, Dongwook Lee, Pak Shing Li, Wolf-Christian Mueller, Romain Teyssier, Sergey Ustyugov, Christian Vogel, Hao Xu 2011, Comparing Numerical Methods for Isothermal Magnetized Supersonic Turbulence, *ApJ*, 737, 13.
76. Oliver Hahn & **Tom Abel** 2011, Multi-scale initial conditions for cosmological simulations, *MNRAS*, 415, 2101.
75. John H. Wise & **Tom Abel** 2011, Enzo+Moray: Radiation Hydrodynamics Adaptive Mesh Refinement Simulations with Adaptive Ray Tracing, *MNRAS*, 414, 3458.
74. **Tom Abel** 2011, The first stars, as seen by supercomputers, *Physics Today*, 04/2011, page 51.
73. **Tom Abel** 2011, *rpSPH*, a novel Smoothed Particle Hydrodynamics Algorithm, *MNRAS*, 413, 271.
72. Matt Turk, Britton Smith, Jeff Oishi, Stephen Skory, Sam Skillman, **Tom Abel** & Michael Norman 2011, yt: A Multi-code Analysis Toolkit for Astrophysical Simulation Data, *ApJS*, 192, 9
71. Matt Turk, Paul Clark, Simon Glover, Thomas Greif, **Tom Abel**, Ralf Klessen, Volker Bromm 2011, Effects of Varying the Three-body Molecular Hydrogen Formation Rate in Primordial Star Formation, *ApJ*, 726, 55
70. Matt Turk, Michael L. Norman, **Tom Abel** 2010, High-entropy Polar Regions Around the First Protostars, *ApJ*, 725, 140
69. Tafelmeyer, M. et al (16 authors) Extremely metal-poor stars in classical dwarf spheroidal galaxies: Fornax, Sculptor, and Sextans 2010, *A&A* 524, 58
68. Zhi-Yun Li, Peng Wang, **Tom Abel**, Fumitaka Nakamura 2010, Lowering the Characteristic Mass of Cluster Stars by Magnetic Fields and Outflow Feedback, *ApJ*, 720, 26
67. Brant Robertson, Andrey Kravtsov, Nickolay Gnedin, **Tom Abel**, Douglas Rudd 2010, Computational Eulerian hydrodynamics and Galilean invariance, *MNRAS*, 401, 2463.
66. Peng Wang, Zhi-Yun Li, **Tom Abel**, Fumitaka Nakamura 2010, Outflow Feedback Regulated Massive Star Formation in Parsec-Scale Cluster-Forming Clumps, *ApJ* 709, 27.
65. Peng Wang, **Tom Abel** & Ralf Kähler 2010, Adaptive Mesh Fluid Simulations on GPU, *NewA*, 15, 581.
64. Michael Busha, Marcelo Alvarez, Risa Wechsler, **Tom Abel**, Louis Strigari 2010, The Impact of Inhomogeneous Reionization on the Satellite Galaxy Population of the Milky Way, *ApJ*, 710, 408.

63. Marcelo Alvarez, Michael Busha, **Tom Abel**, Risa Wechsler 2009, Connecting Reionization to the Local Universe, *ApJ*, 703, 167.
62. Matthew Turk, **Tom Abel**, Brian O'Shea 2009, The Formation of Population III Binaries from Cosmological Initial Conditions, *Science*, 3235, 601.
61. Marcelo Alvarez, John H. Wise & **Tom Abel** 2009, Accretion onto the First Stellar Mass Black Holes, *ApJL*, 701, 133.
62. Ji-hoon Kim, John H. Wise & **Tom Abel** 2009, Galaxy Mergers with Adaptive Mesh Refinement: Star Formation and Hot Gas Outflow, *ApJL*, 694, 123.
59. Peng Wang & **Tom Abel** 2009, Magnetohydrodynamic Simulations of Disk Galaxy Formation: The Magnetization of the Cold and Warm Medium, *ApJ*, 969, 96.
58. Simon Glover & **Tom Abel** 2008, Uncertainties in H<sub>2</sub> and HD chemistry and cooling and their role in early structure formation, *MNRAS*, 388, 1627.
57. John Wise & **Tom Abel** 2008, How the First Stars start Cosmological Reionization, *ApJ*, 684, 1.
56. John Wise & **Tom Abel** 2008, Resolving the Formation of Proto-Galaxies III) Feedback from the First Stars, *ApJ*, 685, 40.
55. John Wise, Matthew Turk & **Tom Abel** 2008, Resolving the Formation of Proto-Galaxies II) Central Gravitational Collapse, *ApJ*, 682, 745.
54. Britton Smith, Steinn Sigurdsson, **Tom Abel** 2008, Metal cooling in simulations of cosmic structure formation, *MNRAS*, 208,
53. John Wise & **Tom Abel** 2008, Suppression of H<sub>2</sub> Cooling in the Ultraviolet Background, *ApJ* 671, 1559.
52. Peng Wang, **Tom Abel**, Weiqun Zhang 2008, Relativistic Flows Using Spatial and Temporal Adaptive Structured Mesh Refinement, *ApJS*, 176, 467.
51. John Wise & **Tom Abel** 2008, Resolving the Formation of Proto-Galaxies I) Virialization, *ApJ*, 665, 899
50. Peng Wang & Tom Abel 2008, Dynamical Treatment of Virialization Heating in Galaxy Formation, *ApJ*, 672, 752.
49. Miroslav Micic, Kelly Holley-Bockelmann, Steinn Sigurdsson, **Tom Abel** 2007, Supermassive black hole growth and merger rates from cosmological N-body simulations, *MNRAS*, 380, 1533
48. Marcelo Alvarez & **Tom Abel** 2007, Quasar HII region during Cosmic Reionization, *MNRAS*, 380, 30.
47. Mordecai-Mark Mac Low, Jayashree Toraskar, Jeffrey S. Oishi, **Tom Abel** 2007, Dynamical Expansion of H II Regions from Ultracompact to Compact Sizes in Turbulent, Self-Gravitating Molecular Clouds, *ApJ*, 668, 980.
46. Amina Helmi, M.J. Irwin, E. Tolstoy, G. Battaglia, V. Hill, P. Jablonka, K. Venn, M. Shetrone, B. Letarte, N. Arimoto, **Tom Abel**, P. Francois, A. Kaufer, F. Primas, K. Sadakane, T. Szeifert 2006, A new view of the dwarf spheroidal satellites of the Milky Way from VLT/FLAMES: Where are the very metal poor stars?, *ApJL* 651, 121.
45. L. Gao, **Tom Abel**, Carlos S. Frenk, Adrian Jenkins, Volker Springel, Naoki Yoshida 2007, The first generation of stars in LCDM cosmology, *MNRAS*, 378, 449.
44. **Tom Abel**, John H. Wise, Greg L. Bryan 2007, The HII Region of a Primordial Star, *ApJL* 659, 87.
44. Ralf Kaehler, John Wise, **Tom Abel**, Hans-Christian Hege 2006, GPU-Assisted Raycasting for Cosmological Adaptive Mesh Refinement Simulations, *Volume Graphics 2006*, 103
43. Naoki Yoshida, Kazuyuki Omukai, Lars Hernquist, **Tom Abel** 2006, Formation of Primordial Stars in a LCDM Universe, *ApJ* 651, 121.
42. G. Battaglia, E. Tolstoy, A. Helmi, M.J. Irwin, B. Letarte, P. Jablonka, V. Hill, K.A. Venn, M.D. Shetrone, N. Arimoto, F. Primas, A. Kaufer, P. Francois, T. Szeifert, **Tom Abel**, K. Sadakane, 2006, The DART imaging and CaT survey of the Fornax Dwarf Spheroidal Galaxy, *A&A* 459, 423.
41. Miroslav Micic, **Tom Abel**, Steinn Sigurdsson 2006, The Role of Primordial Kicks on Black Hole Merger Rates, *MNRAS* 372, 1540.
40. Jiajian Shen, **Tom Abel**, H.J. Mo, Ravi Sheth 2006, An excursion set model of the cosmic web: The Abundance of Sheets, Filaments and Halos, *ApJ* 645, 783-791
39. Brian O'Shea, **Tom Abel**, Dan Whalen & Michael L. Norman 2005, Forming a Primordial Star in a Relic H II Region, *ApJL*, 628, 5.
38. Eline Tolstoy et al., 2004, Two Distinct Ancient Components in the Sculptor Dwarf Spheroidal Galaxy: First Results from the Dwarf Abundances and Radial Velocities Team, *ApJL* 617, 119.
37. John Wise & **Tom Abel** 2005, The Number of Supernovae from Primordial Stars in the Universe, *ApJ* 629 (2005) 615-624.
36. Aaron Sokasian, Naoki Yoshida, **Tom Abel**, Lars Hernquist, Volker Springel 2004, Cosmic

Reionization by stellar sources: Population III stars, *MNRAS*, 350, 47.

35. Yuexing Li, Mordecai-Mark Mac Low, **Tom Abel** 2004, Initial Ionization of Compressible Turbulence, *ApJ*, 610, 339.

34. Emanuele Ripamonti & **Tom Abel** 2004, Fragmentation and the formation of primordial protostars: the possible role of Collision Induced Emission, *MNRAS*, 348, 1019

33. Lijun Gou, Peter Meszaros, **Tom Abel**, Bing Zhang 2004, The Detectability of Long Gamma-Ray Burst Afterglows from Very High Redshifts, *ApJ*, 604, 508.

32. Dan Whalen, **Tom Abel**, Michael L. Norman 2004, Radiation Hydrodynamic Evolution of Primordial HII Regions, *ApJ* 610, 14.

31. Akimi Fujita, Crystal Martin, Mordecai-Mark Mac Low, & **Tom Abel** 2003, The Influence of Supershells and Galactic Outflows on the Escape of Ionizing Radiation from Dwarf Starburst Galaxies, *ApJ*, 599, 50.

30. Aaron Sokasian, **Tom Abel**, Lars Hernquist & Volker Springel 2003, Cosmic reionisation by stellar sources: Population II stars, *MNRAS*, 344, 607.

29. Naoki Yoshida, **Tom Abel**, Lars Hernquist, Naoshi Sugiyama 2003, Simulations of Early Structure Formation: Primordial Gas Clouds, *ApJ*, 592, 645.

28. Frank C. van den Bosch, **Tom Abel**, & Lars E. Hernquist 2003, The Angular Momentum of Gas in Proto-Galaxies: The Impact of Preheating, *MNRAS*, 346, 177

27. Konstantinos Tassis, **Tom Abel**, Greg L. Bryan and Michael L. Norman 2003, Numerical Simulations of high redshift Star Formation in Dwarf Galaxies, *ApJ* 587, 13.

26. Marie E. Machacek, Greg L. Bryan, **Tom Abel** 2003, Effects of a Soft X-ray Background on Structure Formation at High Redshift, *MNRAS*, 338, 273.

25. Aaron Sokasian, **Tom Abel** & Lars E. Hernquist 2002, The Nature of the Ionizing Background at  $z = 2.5-5$ , *MNRAS*, 340, 473.

24. Frank C. van den Bosch, **Tom Abel**, Rupert A. C. Croft, Lars E. Hernquist & Simon D. M. White 2002, The Angular Momentum of Gas in Proto-Galaxies: Implications for the Formation of Disk Galaxies, *ApJ*, 576, 21.

23. Marie E. Machacek, Greg L. Bryan, **Tom Abel** 2002, Effects of a Soft X-ray Background on Structure Formation at High Redshift, *ApJ*, 540, 39.

22. Aaron Sokasian, **Tom Abel** & Lars Hernquist 2002, The Epoch of Helium Reionization, *MNRAS*, 332, 601.

21. Alexei Razoumov, Michael L. Norman, **Tom Abel**, & Douglas Scott 2002, Cosmological Hydrogen Reionization with Three Dimensional Radiative Transfer, *ApJ*, 572, 695.

20. **Tom Abel**, Ben Wandelt 2002, Adaptive Ray Tracing for Radiative Transfer around Point Sources in Astrophysical Hydrodynamics, *MNRAS*, 330, L53.

19. **Tom Abel**, Greg L. Bryan, Michael L. Norman 2002, The Formation of the First Star in the Universe, *Science*, 295, 93A.

18. Tiziana Di Matteo, Rosalba Perna, **Tom Abel**, Martin J. Rees 2002, Radio Foregrounds for the 21cm Tomography of the Neutral Intergalactic Medium at High Redshifts, *ApJ*, 564, 576.

17. Greg L. Bryan, **Tom Abel**, Michael L. Norman 2001, Technical paper at Supercomputing 2001, Achieving Extreme Resolution in Numerical Cosmology Using Adaptive Mesh Refinement: Resolving Primordial Star Formation, Gordon Bell prize finalist.

16. Nick Gnedin and **Tom Abel** 2001, Multidimensional Cosmological Radiative Transfer with a Variable Eddington Tensor Formalism, *NewA*, 6, 437.

15. Aaron Sokasian, **Tom Abel**, Lars Hernquist 2001, Simulating Reionization in Numerical Cosmology, *NewA*, 6, 359.

14. Zoltan Haiman, **Tom Abel**, Piero Madau 2001, Photonconsumption in Minihalos during Cosmological Reionization, *ApJ*, 551, 599.

13. Marie E. Machacek, Greg L. Bryan, **Tom Abel** 2001, Simulations of Pregalactic Structure Formation with Radiative Feedback *ApJ*, 540, 39.

12. **Tom Abel**, Greg Bryan, Michael L. Norman 2000, The Formation and Fragmentation of Primordial Molecular Clouds, *ApJ*, 540, 39.

11. Zoltan Haiman, **Tom Abel**, Martin J. Rees 2000, The Radiative Feedback of the First Cosmological Objects, *ApJ*, 534, 11.

10. Benedetta Ciardi, Andrea Ferrara, **Tom Abel** 2000, Intergalactic H<sub>2</sub> Photodissociation and the soft UV Background produced by Population III objects., *ApJ*, 533, 594.

9. **Tom Abel**, Martin G. Haehnelt 1999, Radiative Transfer Effects during Photoheating of the Intergalactic Medium, *ApJL*, 520, 13L.

8. **Tom Abel**, Michael L. Norman, Piero Madau 1999, Photon Conserving Radiative Transfer in Multidimensional Numerical Cosmology, *ApJ*, 523, 66.
7. J. Kepner, T.M. Tripp, **Tom Abel**, D. Spergel 1999, Absorption Line Signatures of Gas in Dark Matter Minihalos, *AJ*, 117, 2063.
6. **Tom Abel**, Albert Stebbins, Peter Anninos, & Michael L. Norman 1998, First Structure Formation II) Cosmic String + HDM Models, *ApJ*, 508, 530.
5. **Tom Abel**, Peter Anninos, Yu Zhang, & Michael L. Norman 1998, First Structure Formation I) Primordial Star Forming Regions in Hierarchical Models, *ApJ*, 508, 518.
4. **Tom Abel**, and H.J. Mo 1998, A "Minihalo" Model for the Lyman Limit Systems at High Redshift, *ApJL*, 494, L151.
3. Peter Anninos, Yu Zhang, **Tom Abel**, & Michael L. Norman 1997, Cosmological Hydrodynamics with Multi-Species Chemistry and Nonequilibrium Ionization and Cooling, *New Astronomy*, 2, 209.
2. **Tom Abel**, Peter Anninos, Yu Zhang, & Michael L. Norman, 1997, Modelling Primordial Gas in Numerical Cosmology, *New Astronomy*, 2, 181.
1. Max Tegmark, Joseph Silk, Martin J. Rees, Alain Blanchard, **Tom Abel**, & Francesco Palla, 1997, How small were the First Cosmological Objects?, *APJ*, 474, 1.

### Reviews & Books

1. Achim Weiss, **Tom Abel** and Vanessa Hill (eds.) 2000, *The First Stars*, Proceedings of the second MPA/ESO conference held in Garching, August 1999, Springer Verlag.
2. **Tom Abel**, Zoltan Haiman 2000, *The Role of H<sub>2</sub> Molecules in Cosmological Structure Formation*, invited review for "Molecular Hydrogen in Astrophysics", Nova Science Books, eds. F. Combes, De Forest, G.
3. Emanuele Ripamonti & **Tom Abel** 2005, *The Formation of Primordial Luminous Objects*, Lecture notes for the spring 2003 SIGRAV Doctoral School "The Joint Evolution of Black Holes and Galaxies", M.Colpi, V.Gorini, F. Haardt, U. Moschella (eds.), "Joint Evolution of Black Holes and Galaxies", series in High Energy Physics, Cosmology and Gravitation, Institute of Physics Publishing, Bristol and Philadelphia

### Contributed Papers

1. Yu Zhang, Michael L. Norman, Peter Anninos, **Tom Abel** 1997, Primordial Star Forming Regions in CDM Models, in *Star Formation Near and Far*, eds. Holt.
2. **Tom Abel**, Greg L. Bryan, Michael L. Norman 1998, Simulating First Structure Formation, in "H<sub>2</sub> in the early Universe", eds. Palla, F., Galli, D., Corbelli, E., *Memorie Della Societa Astronomica Italiana*.
3. Michael L. Norman, Pascal Paschos, **Tom Abel** 1998, Simulating inhomogenous Reionization, in "H<sub>2</sub> in the early Universe", eds. Palla, F., Galli, D., Corbelli, E., *Memorie Della Societa Astronomica Italiana*.
4. **Tom Abel**, Greg L. Bryan, Michael L. Norman 1999, First Structure Formation, in "Evolution of Large Scale Structure: From Recombination to Garching", eds. Banday, T., Sheth, R. K. and Costa, L. N.
5. **Tom Abel**, Greg L. Bryan, Michael L. Norman 1999, From the Universe to the Stars, in "From Stars to the Universe: 3rd German-Chinese mini-workshop on Cosmology.
6. Michael L. Norman, **Tom Abel**, Greg Bryan 1999, From Cosmological Initial Conditions to Primordial Protostellar Cloud Cores, in the proceedings of the Workshop on "From Stars to Galaxies to the Universe", Ringberg Castle, Germany in June 1998, eds. Gerhard Börner and Houjun Mo.
7. Michael L. Norman, **Tom Abel**, Greg Bryan 2000, First Structure Formation and the First Stars, in the proceedings of the MPA/ESO Workshop on "The First Stars", Garching, Germany in August 1999, Springer, eds. Weiss, A., Abel, T. and Hill V.
8. **Tom Abel** 2000, Three Dimensional Radiative Transfer in Numerical Cosmology, in the proceedings of "Plasma 99" held in Mexico City Oct. 99, ed. Franco, J.
9. **Tom Abel**, Greg L. Bryan, M. L. Norman 2000, Forming the First Star in the Universe, in the proceedings of "The Physics of Galaxy Formation", Tskuba, Japan, eds. K. Umemura & H. Susa
10. **Tom Abel**, Greg L. Bryan, M. L. Norman 2001, The Initial Mode of Star Formation in the proceedings of "Modes of Star Formation", Heidelberg, Germany, ed. E. Grebel
11. Alexander Heger, Stan E. Woosley, I. Baraffe & **Tom Abel** 2001, Evolution and Explosion of Very Massive Primordial Stars, MPA/ESO/MPE/USM Joint Astronomy Conference Lighthouses of the Universe: The Most

Luminous Celestial Objects and their Use for Cosmology, ESO Symposia Conference Series, Springer, eds. R. Sunyaev, M. Gilfanov, E. Churazov

12. **Tom Abel** 2002, The Basic Building Blocks of Galaxies, in the proceedings of "The Evolution of Galaxies: Basic Building Blocks", eds. M. Sauvage, G. Stasinska, L. Vigroux, D. Schaerer, S. Madden

13. Brian W. O'Shea, Greg Bryan, James Bordner, Michael L. Norman, **Tom Abel**, Robert Harkness, Alexei Kritsuk 2004, in "Adaptive Mesh Refinement - Theory and Applications", Eds. T. Plewa, T. Linde & V. G. Weirs, Springer Lecture Notes in Computational Science and Engineering, 2004.

14. E. Ripamonti, E. Tolstoy, A. Helmi, G. Battaglia, **Tom Abel** 2006, Numerical simulations of the metallicity distribution in dwarf spheroidal galaxies, Proceedings of the CRAL-Conference Series I "Chemodynamics: from first stars to local galaxies", Lyon 10-14 July 2006, France, Eds. Emsellem, Wozniak, Massacrier, Gonzalez, Devriendt, Champavert, EAS Publications Series.

15. O'Shea, Brian W.; McKee, Christopher F.; Heger, Alexander; **Abel, Tom** 2008, Conference summary, "Proceedings of First Stars III," Eds. Brian W. O'Shea, Alexander Heger & Tom Abel

#### Successful Proposals

1. E. Bergin, T. Hunter, T. Shridharan, **Tom Abel**, Alex Dalgarno 2001, A Search for Lithium Bearing Molecules in the Galaxy, Awarded 3 nights in Dec. 2001 at the Caltech Submillimeter Observatory

2. **Tom Abel**, Stars and Galaxies in the First Billion Years, 2003-2008: NSF CAREER Award, 700,000\$

3. Dart Collaboration: PI: E. Tolstoy, 7 nights of VLT time fall 2003

4. **Tom Abel**, Matthew Shetrone, Eline Tolstoy, 4 hours of HET time in Spring 2003 for high resolution spectroscopy of metal poor red giants in nearby dwarf spheroidals.

5. Eline Tolstoy, **Tom Abel**, Amina Helmi, 3 year funding of postdoc position to work with PI's.

6. NASA AFTP joint with Michael L. Norman 2008-20011, funds one graduate student and one postdoc

7. NSF AST grant joint with Yuexing Li 2008-2011 (Penn State) funds two graduate students.

8. NSF AST joint with Ivan Hubeny, 2008-2011 on Radiation transport methods

9. SciDAC, PI S. Habib, "Computation-Driven Discovery for the Dark Universe"

#### Awards

Oskar Karl Forster Scholarship, 1993

DAAD Scholarship, 1993-1994

Wempe Prize, Potsdam 2000 ([http://www.aip.de/misc/Wempe/index\\_e.html](http://www.aip.de/misc/Wempe/index_e.html))

NSF Career Award (2003-2008) 700 k

Terman Fellow, Stanford 9/2007-9/2010, 250 k

Lagrange Prize, 100,000 € Institute Lagrange de Paris, Paris, France

#### Meetings (co-) organized (Listing only major activities not including general SOC membership)

1999 First Stars, Garching, Germany with Achim Weiss & Vanessa Hill

2003 The Baryonic Universe, Aspen Winter workshop with Rosie Wyse

2003 First Stars II, Penn State, State College (Chair)

2004 GRB physics before SWIFT, State College, PA, (Chair)

2004 Formation of Supermassive Black Holes, Aspen, with  
Andrew Hamilton, Martin Haehnelt & Andrea Ghez

2006 The First Stars and Evolution of the Early Universe, INT Seattle with Yong Qian, Alex Heger and Tim Beers

2007 First Stars III, Santa Fe, NM with Alex Heger and Brian O'Shea

2007 Star formation over cosmic time, 4 month workshop at KITP Santa Barbara  
with C. McKee, P. Padoan, A. Goodman

2008 Scientific Challenges for Understanding the Quantum Universe and the Role of  
Computation at the Extreme Scale, SLAC

2009 Kavli Futures Symposium, "Solving Real Problems with imagined Computers"  
Many Core and Accelerator Based Computing workshop, held at SLAC

2010 Kavli Futures Symposium, "Growing High Performance Computing in a Green  
Environment", Tromso, Norway

2013 KIPAC@10, Big Questions in Particle Astrophysics and Cosmology, KIPAC, Stanford, US

2014 Collisionless Fluids, a workshop at the Institute Lagrange de Paris & IAP

### Synergistic Activities:

Refereeing for ApJ, MNRAS, Science, Nature, NewA, A&A since 1998

Consulting for National Geographic Magazine 2003

NSF Postdoc review panel, HST panels, DOE INCITE panels, Astro 2010, since 2002

Advisory Board for Hayden Planetarium Space Show "Journey to the Stars", 2008-2009, 2012-2013

Invited Talks given at International Conferences June 2014 Zel'dovich 100,  
Moscow, Russia

February 2014 Tracing the Cosmic Web, Lorentz Center, Leiden, Netherlands

October 2013 GRAVASCO, Institute Poincare, Paris, France

June 2013 IAP Colloquium, "Origin of the Hubble Sequence", Paris, France

August 2013 HIPACC Summer School, UCSC, US

May, 2013 Lecturer at Radiation Hydrodynamics Summer School, Leiden, Netherlands

January 2013 Plenary speaker AAS meeting Long Beach

November 2012 East Asian Numerical Astrophysics meeting, Kyoto, Japan

August 2012 Georgia Tech Vislab workshop and public talk to ~ 300 on Dark Matter

May 2012 First Stars IV, Kyoto, Japan

January 2012 New Horizons in Computational Astrophysics, Davos, Switzerland

July 2011 Galaxy Formation, Durham, UK

June 2011 First Galaxies, Ringberg, Bavaria, Germany

May 2011 The Origin of the Elements: A Modern Perspective, ECT\*, Trento, Italy

October 2010 Numerical Astrophysics, Wengen, Switzerland

September 2010 Kavli Futures Symposium, Tromso, Norway

August 2010 First Stars summer school Heidelberg, Germany  
HIPACC summer school, Santa Cruz, CA

July 2010 GR19 Plenary talk, Mexico City, Mexico

June 2010 IAU Star Formation, Barcelona, Spain  
First Galaxies, Quasars & Gamma Ray Bursts, State College, PA  
Lisa Symposium Menlo Park, CA

March 2010 First Stars and Galaxies, Austin, Texas  
The View from 5 AU, Irvine, CA

January 2010 Massive Star Formation, Berkeley, CA

July 2009 13th Paris Cosmology Colloquium, Paris, France

June 2009 Institute for Nuclear Theory School Quarks to Cosmos, 3 lectures, Seattle, WA

May 2009 Inaugural Meeting of Center for Relativistic Astrophysics, Georgia Tech, GA

May 2009 Astroviz 2009, California Academy of Sciences, San Francisco, CA

January 2009 Kavli Futures Symposium, Real Problems for Imagined Computers, Costa Rica

December 2008 Texas meeting on Relativistic Astrophysics, Plenary talk, Vancouver, Canada

September 2008 Cosmic Dust and Radiative Transfer workshop, Heidelberg, Germany

September 2008 JENAM, "New Challenges to European Astronomy", Vienna, Austria

July 2008 AstroSim, Ascona, Switzerland  
Far Away: Light in the Young Universe, IAP Conference, Paris, France

June 2008 IAU Symposium, Low metallicity Star formation, Rapallo, Italy  
Onassis School, Crete, Greece

May 2008 Sackler Cosmology meeting: "21cm Cosmology", Harvard, Cambridge, MA

March 2008 Canadian Institute for Advanced Research, Stanford, CA

September 2007 JWST and concurrent facilities, Tucson, AZ

September 2007 Massive Star Formation: Observations confront Theory, Heidelberg, Germany

August 2007 Star formation then and now, Kavli Inst. of Theoretical Physics, Santa Barbara

August 2007 Lectured at SLAC summer school on Dark Matter, Stanford, CA

June 2007 School on Multiscale Modeling and Simulation in Science, Bosön, Sweden

May 2007 Structure Formation in the Universe, Chamonix, France



March 2007 The Next Decade of GRB Afterglows, Amsterdam, Netherlands  
 October 2006 Radiation Backgrounds, Maryland October meeting, Baltimore  
 September 2006 Circumstellar Media & Late Stages of Mass. Stell. Evol., Ensenada, MX  
 July 2006 4 lectures at Summer School in Cosmology and Astrophysics, ICTP, Trieste, It  
 Star Formation from Galactic to Cosmological Scales, Heidelberg, Germany  
 The First Stars and Evolution of the Early Universe, Seattle  
 June 2006 SWIFT and GRBs: Unveiling the Relativistic Universe, Venice, Italy  
 April 2006 Mitchell Symposium, Institute for Fundamental Physics, College Station, TX  
 October 2005 Probing Early Structure Formation with M, L and Z, Minneapolis, MN  
 September 2005 Structure of the Universe, Future of Cosmology, Crafoord days, Stockholm  
 June 2005 Reionizing the Universe, Groningen, Netherlands  
 October 2004 Galaxy-Intergalactic Medium Interactions, KITP, Santa Barbara  
 September 2004 Summary Talk, Computational Methods in Transport, Lake Tahoe  
 Mathematical and Experimental Physics, Collegio Nacional, Mexico City  
 August 2004 Chemical Enrichment of the Early Universe, Santa Fee  
 July 2004 Plumian 300, The Quest for a Concordance Cosmology, Cambridge, UK  
 June 2004 17th UCL colloquium, Massive Star Formation, Windsor Great Park, UK  
 Frontiers of Science, National Academy and Royal Society, Cambridge, UK  
 May 2004 Intermediate Mass Black Holes, Penn State, State College.  
 Most Massive Stars, Jackson Hole, Wyoming  
 December 2003 Gravitational Collapse: From Massive Stars to Planets, Ensenada Mexico  
 November 2003 Formation and Evolution of Young Massive Cluster, Cancun, Mexico  
 Galaxy Formation: A Herculean Challenge, Banff, Canada  
 October 2003 The Future of Cosmology, KAVLI-CERCA conference, Cleveland  
 August 2003 From First Light to the Milky Way, Zürich, Switzerland  
 July 2003 The Formation and Early Evolution of Galaxies, Irsee, Germany  
 June 2003 SCaLEs, DOE Workshop on the Future of Computing in the US, DC  
 Recontres de Blois, Blois, France  
 May 2003 Great Lakes Cosmology Conference, Ann Arbor, Michigan  
 4 Lectures at Como Summer School, Como, Italy  
 Jan. 2003 Globular Clusters, ITP, Santa Barbara, California  
 Oct. 2002 The Emergence of Cosmic Structure, College Park, US  
 July 2002 4th International Lisa Symposium, State College, PA, US  
 Making Light of Gravity, Martin Rees' 60th birthday, Cambridge, UK  
 June 2002 A Massive Star Odyssey IAU Symp. 212, Lanzarote, Spain  
 Early Cosmic Structures and the End of the Dark Ages, Elba, Italy  
 March 2002 Low Z at high and low z, Michigan  
 XEUS Workshop at MPE, Garching, Germany  
 19. Oct, 2001 Euroconference: Basic Building Blocks of Galaxies, Reunion, France  
 June 2001 Frontiers of the Universe, Euroconference Blois, France  
 11. October 2000 Modes of Star Formation, Heidelberg, Germany  
 4. July 2000 The Physics of Galaxy Formation, Tsukuba, Japan  
 18. May 2000 The First Generation of Cosmic Structures, Harvard  
 30. Sept. 1999 H<sub>2</sub> in Space, Paris  
 28. May 1999 Oort workshop, Leiden  
 4. Dec. 1997 Workshop on "H<sub>2</sub> in the Early Universe", Arcetri/Italy

#### Contributed Talks and Colloquia

27. May 2014 Inaugural Mandel Lecture, UCSC, Santa Cruz, CA  
 17. May 2014 Enzo Workshop, "The Enzo-Universe", Columbia, NYC  
 7. May 2014 Caltech colloquium, "Dark Matter Dynamics", Pasadena, CA  
 1. May 2014 SLAC Science Policy Committee, "Cosmic Frontier Strategy"  
 19 April 2014 Lecture on Hydrodynamics at Callistoga Study Sessions, CA  
 21. March 2014 HIPAC Computational Astrophysics Meeting, LBL, CA  
 23. September 2013 "What Physicists do" series at Sonoma State, Sonoma

21. June 2013 IAP colloquium, Institute Astrophysique de Paris, Paris, France  
 17. June 2013 Gravitational Lensing Workshop, Courmayeur, Italy  
 23. May 2013 ICAP meeting at IAP, Paris, France  
 11. March 2013 SLAC colloquium, "Why Dark Matter Matters", Menlo Park, CA  
 13. September 2012 ITC colloquium, CfA Harvard, MA  
 16. August 2012 Santa Cruz workshop on Galaxy formation  
 12. April 2012 KITP: First Galaxies and Faint Dwarfs, Santa Barbara, CA  
 13. October 2011 Enzo workshop, Columbia University, NYC  
 14. March 2011 Colloquium, Heidelberg Institute of Theoretical Studies, Germany  
 15. February 2011 Stony brook physics and astronomy colloquium, Stony Brook, NY  
 14. February 2011 NSF distinguished lecture, Arlington, VA  
 8. February 2011 IAS seminar, Princeton, NJ  
 27. January 2011 IAC Colloquium, La Laguna, Tenerife, Spain  
 12. January 2011 Physikalisches Kolloquium, Tübingen, Germany  
 11. November 2010 CITA colloquium, Toronto, Canada  
 30. June 2010 Enzo Users workshop, San Diego, CA  
 13. April 2010 Cafe Scientific, SRI International, Menlo Park, CA  
 1. February 2010 Dean Lecture, California Academy of Sciences, San Francisco, CA  
 20 October 2009 Joint Astronomy colloquium, Heidelberg, Germany  
 5. November 2009 Harvard ITC colloquium, CfA, Boston, MA  
 29. September 2009 Stanford Physics Colloquium  
 21. September 2009 Berkeley Physics Colloquium  
 22. April 2009 Colloquium at SETI Institute  
 19. November 2008 Caltech Astronomy Colloquium, Pasadena, CA  
 15. October 2008 Hooker Distinguished visiting Professor lecture: Cosmic Dawn: The First Star  
 in the Universe, McMaster University, Hamilton, Ontario, Canada  
 15. October 2008 McMaster, Ontario, Canada, Physics Colloquium  
 2. September 2008 MPA cosmology seminar, Garching, Germany 29. April 2008 SLAC  
 public lecture, Cosmic Dawn: The First Star in the Universe  
 25. Feb 2008 Berkley TAC seminar, UCB, Berkeley  
 20. Nov 2007 Colloquium, physics department, UCSB, Santa Barbara  
 22. Oct 2007 Mechanical Engineering Colloquium, UCSB, Santa Barbara  
 1. Oct 2007 Directors blackboard lunch, KITP, Santa Barbara  
 25. Sep 2007 New York University, Astrophysics seminar, New York City  
 24. Sep 2007 Hayden Planetarium public lecture, Rose Center, AMNH, NYC  
 24. Sep 2007 American Museum of Natural History, Seminar, NYC  
 18. Jul 2007 Public Talk at First Stars III, Santa Fe, NM  
 11. Apr 2007 UCLA Physics colloquium, Los Angeles  
 30. Mar 2007 SLAC theory seminar  
 1. Dec 2006 Presentation to SLAC Science Policy Committee  
 11. Sept 2006 SLUO Annual meeting, SLAC  
 29. August 2006 High Performance Computing day, Stanford  
 7. Oct 2005 SLAC Computing Services seminar, Stanford  
 27. May 2005 TAC theory seminar, UC Berkley  
 25. Apr 2005 Physics Colloquium, UC Davis  
 18. Apr 2005 Colloquium National Observatory Japan, Tokyo  
 2. Feb 2005 Astronomy Colloquium, UC Santa Cruz  
 18. Jan 2005 Physics Colloquium, Stanford University  
 11. Jan 2005 Fluid Mechanics seminar, Center for Turbulence Research, Stanford  
 12. Oct 2004 Colloquium, Northwestern University Chicago  
 10. Mar 2004 Colloquium, Max Planck Institut für Astronomie, Heidelberg  
 4. Mar 2004 Physics Colloquium, Stanford University, Palo Alto  
 30. Jan. 2004 Star Formation Workshop, NASA Ames, California  
 22. Oct. 2003 Astronomy Colloquium, California Institute of Technology, Pasadena  
 20. Oct. 2003 Astronomy Colloquium, University of Arizona, Tucson

2. Oct 2003 Astrophysics Seminar, McMaster University, Hamilton Ontario  
 1. Oct 2003 Physics Colloquium, McMaster University, Hamilton Ontario  
 19. Sep. 2003 Astrophysics Seminar, New York University  
 18. Sep. 2003 Physics Colloquium, New York University  
 10. Sep. 2003 Colloquium Space Telescope Science Institute  
 13. Aug 2003 Mini workshop on First Structure Formation, Oxford, UK  
 18. April, 2003 Colloquium, Dept. of Physics, University of Virginia, Charlottesville  
 10. Apr 2003 Colloquium, Dept. of Physics, Lehigh, Bethlehem, US  
 24. Mar. 2003 Colloquium, Leiden Observatory, Leiden, Nova Lecture series  
 20. Mar. 2003 Colloquium, Kapteyn Institute, Gronningen, Nova Lecture series  
 28. Feb. 2003 Public Talk, Museum of the Rockies, Bozeman, Montana  
 13. Feb. 2002 Colloquium, Dept. of Astronomy, Michigan State, US  
 15. Jan. 2003 Public Talk, Wheeler Opera house, Aspen, Colorado  
 7. Oct. 2002 Colloquium, Dept. of Physics, University of Colorado, Boulder, US  
 27. Sept. 2002 Colloquium, Dept. of Physics, UPENN, Philadelphia, US  
 26. Sept. 2002 Colloquium, Dept. of Physics, Rutgers University, NJ, US  
 25. April, 2002 Colloquium, Dept. of Astronomy, Ohio State University, US  
 15. Feb. 2002 Colloquium, Dept. of Theoretical Astrophysics, Caltech, US  
 30. Nov., 2001 Colloquium, Dept. of Astronomy, Leeds, UK  
 29. Nov., 2001 Colloquium, Dept. of Mathematics, Newcastle upon Tyne, UK  
 22. May, 2001 Colloquium, Goddard Space Flight Center  
 11. April, 2001 Colloquium, Ecole Normal Superieur, Lyon, France  
 February, 2001 Aspen Winter Conference  
 11. Jan. 2001 Colloquium, Univ. of Washington, Seattle  
 14. Dec. 2000 Colloquium, Penn State, State College  
 27. Nov. 2000 High Energy Astrophysics Colloquium, U. of Michigan, Ann Arbor  
 21. Nov. 2000 Astronomy Colloquium, University of Illinois, Urbana/Champaign  
 16. Nov. 2000 Colloquium, Carnegie Mellon University, Pittsburgh  
 April 2000 Colloquium, University of California, Santa Cruz  
 3. Feb. 2000 Colloquium, UGA Astronomy Department, Athens  
 30. June 1999 Clustering at high z, Marseilles  
 7. Dec. 1999 Colloquium, Yale Astronomy Department, New Haven  
 10. Oct. 1998 3rd German-Chinese mini-workshop on Cosmology, Shanghai  
 28. Oct. 1998 Beijing Observatory  
 8. Sept. 1998 German American Young Scholar Inst. on Astroparticle Physics, Aspen/US  
 3. Sept. 1998 TMR-Workshop, Leiden/Netherlands  
 7. Aug. 1998 MPA/ESO Cosmology Conference, Garching/Germany  
 June 1998 3 talks, Workshop on Galaxy Formation & Feedback, Aspen, US  
 25. Sep. 1997 Colloquium at Arcetri Observatory, Italy  
 18. Jul. 1997 MPA Seminar, Max Planck Institute for Astrophysics  
 7. May 1997 Instituto de Astronomia UNAM/Mexico  
 27. Sep. 1996 UNLV Physics Department Colloquium, Las Vegas  
 3. June 1996 DAEC Seminar at the l'Observatoire de Paris, Meudon.  
 25. March 1996 Colloquium Instituto Astrofisica de Canarias, Tenerife

#### Longer Visits & Schools

2013 Institute Astrophysique de Paris, IAP, Paris, France  
 2012 KITP, Dwarf galaxies ~ 2 months  
 2007 KITP, 4 months, Star formation over cosmic time  
 8/03 Dept. of Physics, Oxford, UK  
 4/7-4/14/01 Ecole Normal Superieur, Lyon, France  
 4/01 Saas Fee Lectures on Brown Dwarfs and Planets, Switzerland  
 5/99 Massachusetts Institute of Technology  
 3/99 Saas Fee Lectures on Star Formation in Galaxies, Switzerland.  
 3/97 Instituto de Astronomia UNAM/Mexico

5/27/96-6/7/96           Nato Advanced Study Institute, The Cosmic Microwave  
Background Radiation", Strassbourg, France  
4/95 - 6/96               Max Planck Institute for Astrophysics, Garching  
2/96 - 3/96               Instituto Astrofisica de Canarias, Tenerife, Spain  
7/95 - 1/96               Max Planck Institute for Astrophysics, Garching

#### Graduate and post-graduate students (co-) supervised

Aaron Sokasian, PhD 2003 Harvard supervised with Lars Hernquist  
Dan Whalen, Brian O'Shea (PhD 2006) supervised with Michael Norman  
At Penn State: Britton Smith, Miroslav Micic, Jianjian Shen, Manodeep Sinha  
At Stanford: John Wise (PhD 2007), Fabio Iocco (2007), Peng Wang (PhD 2009), Matthew Turk (PhD 2009), Fen Zhao (PhD 2010), Ji-hoon Kim (PhD 2011), Sam Totter 2013-, Devon Powell 2013-, Julian Kates-Harbeck 2013-2014  
Postdocs: Emanuele Ripamonti 2002-2004, Marcelo Alvarez 2006-2009,  
Andres Escala 2006-2009, Oliver Hahn 2009-2012, Jeff Oishi 2010-2012, Raul Angulo 2012-2013, Silvia Bonoli 2012-2013, Jonathan Zrake 2013-, Sam Skillman 2013-, William East 2013-

#### Media:

2012: PBS Science bytes: "Dark Matters" <http://video.pbs.org/video/2253154199/>  
2012: Reuters: "Researchers shine bright light on dark matter" online video  
2010: Inside the Milky Way, National Geographic television, Interviewed in show and contributed animations

Developed animation of galaxy formation for a new show for the Big Bang theater at the American Museum for Natural History at New York.

Created animation on the first stars for "Life: A Cosmic Story" which was produced and premiered at the California Academy of Sciences in San Francisco  
2009: "Journey to the Stars" narrated by the Whoopi Goldberg, AMNH, Rose Center, New York, NY  
2013: "The Dark Universe" narrated by Neil deGrasse Tyson, AMNH, Rose Center, New York City, this time KIPAC credited as partner, and we contributed three separate scenes.

#### Previous TV:

"The Unfolding Universe" Discovery Channel, 2002 showed a 2 minute animation of our work  
"Origins" PBS NOVA series, aired Oct. 2004 with 1 minute animation of our simulations,  
FOX news (2006) showed our models of the Bullet cluster, 3 minutes of material for  
"Apocalypse How" Discovery Channel 2008.

Our research appeared in cover stories for Discover (Dec 2002), National Geographic (Feb 2003), Physics World (Mar 2003), Symmetry (2005), Discover (Dec 2005), Astronomy Magazine Dec (2005), Discover (2009), Discover (2010, 2014), Science News (2003, 2009, 2011), Physics Today (2011), Scientific American (2014)

Other print media accounts: space.com, Züricher Tagblatt, Spiegel

Radio: BBC radio (2002), "Quirks and Quarks" Canada (Oct 2003), BBC radio (2006), Stanford KZSU

Planetaria: Contributed materials for all space shows produced at AMNH so far. The latest was a 2 minute sequence of the birth, life and death of the first stars narrated by Whoopi Goldberg. These shows currently reach approximately 3 million viewers a year with a third being high school students worldwide.

#### For references:

Michael L. Norman, Roger Blandford, Simon D.M. White, Lord Martin Rees