

LIST OF PUBLICATIONS

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REFEREED PUBLICATIONS

66. **Jens Chluba** & Yacine Ali-Haimoud (arXiv:1510.03877)
“COSMOSPEC: fast and detailed computation of the cosmological recombination radiation from hydrogen and helium”, *MNRAS*, 456, 3494, (2016)
65. Colin Hill, Nick Battaglia **Jens Chluba**, Simone Ferraro, Emmanuel Schaan & David Spergel (arXiv:1507.01583)
“Taking the Universe’s Temperature with Spectral Distortions of the Cosmic Microwave Background”, *PRL*, 115, 261301, (2015)
64. **Jens Chluba** (arXiv:1506.06582)
“Green’s function of the cosmological thermalization problem - II. Effect of photon injection and constraints”, *MNRAS*, 454, 4182, (2015)
63. S. Balashev, E. Kholupenko, **Jens Chluba**, A. Ivanchik & D. Varshalovich (arXiv:1505.06028)
“Spectral Distortions of the CMB Dipole”, *ApJ*, 810, 6, (2015)
62. Mayuri Rao, Ravi Subrahmanyan, Shankar Udaya & **Jens Chluba** (arXiv:1501.07191)
“On the detection of spectral ripples from the Recombination Epoch”, *ApJ*, 810, 19, (2015)
61. Yacine Ali-Haimoud, **Jens Chluba** & Marc Kamionkowski (arXiv:1506.04745)
“Constraints on Dark Matter Interactions with Standard Model Particles from Cosmic Microwave Background Spectral Distortions”, *PRL*, 115, 071304, (2015)
60. **Jens Chluba**, Daniela Paoletti, Fabio Finelli & Jose Alberto Rubino-Martin (arXiv:1503.04827)
“Effect of primordial magnetic fields on the ionization history”, *MNRAS*, 451, 2244, (2015)
59. Razieh Emami, Emanuela Dimastrogiovanni, **Jens Chluba** & Marc Kamionkowski (arXiv:1504.00675)
“Probing the scale dependence of non-Gaussianity with spectral distortions of the cosmic microwave background”, *PRD*, 91, 123531, (2015)
58. **Jens Chluba**, Jan Hamann & Subodh Patil (arXiv:1505.01834)
“Features and new physical scales in primordial observables: Theory and observation”, *IJMPD*, 24, 1530023, (2015)
57. **Jens Chluba**, Liang Dai, Daniel Grin, Mustafa Amin & Marc Kamionkowski (arXiv:1407.3653)
“Spectral distortions from the dissipation of tensor perturbations”, *MNRAS*, 446, 2871, (2015)
56. **Jens Chluba** (arXiv:1405.1277)
“Tests of the CMB temperature-redshift relation, CMB spectral distortions and why adiabatic photon production is hard”, *MNRAS*, 443, 1881, (2014)
55. Donghui Jeong, Josef Pradler, **Jens Chluba**, & Marc Kamionkowski (arXiv:1403.3697)
“Silk Damping at a Redshift of a Billion: New Limit on Small-Scale Adiabatic Perturbations”, *PRL*, 113, 061301, (2014)
54. Simon Glover, **Jens Chluba**, Steve Furlanetto, Jonathan Prichard, Daniel Savin
“Chapter Three - Atomic, Molecular, and Optical Physics in the Early Universe: From Recombination to Reionization”, *AAMOP*, Volume 63, p. 135-270, (2014)

53. **Jens Chluba**, Liang Dai, Donghui Jeong, Marc Kamionkowski & Amanda Yoho (arXiv:1404.2798)
“Linking the BICEP2 result and the hemispherical power asymmetry through spatial variation of r ”, *MNRAS*, 442, 670, (2014)
52. Liang Dai & **Jens Chluba** (arXiv:1403.6117)
“New operator approach to the CMB aberration kernels in harmonic space”, *PRD*, 89, 123504, (2014)
51. Joseph Silk & **Jens Chluba**
“Next Steps for Cosmology”, *Science*, 344, 586, (2014)
50. **Jens Chluba** (arXiv:1312.6030)
“Refined approximations for the distortion visibility function and mu-type spectral distortions”, *MNRAS*, 440, 2544, (2014)
49. **Jens Chluba** & Liang Dai (arXiv:1309.3274)
“Multiple scattering Sunyaev-Zeldovich signal II: relativistic effects”, *MNRAS*, 438, 1324, (2014)
48. Philippe Andre et al. (arXiv:1310.1554)
“PRISM (Polarized Radiation Imaging and Spectroscopy Mission): an extended white paper”, *JCAP*, 02, 006, (2014)
47. Donghui Jeong, **Jens Chluba**, Liang Dai, Marc Kamionkowski and Xin Wang (arXiv:1309.2285)
“The effects of aberration on partial-sky measurements of the cosmic microwave background temperature power spectrum”, *PRD*, 89, 023003, (2014)
46. **Jens Chluba** and Donghui Jeong (arXiv:1306.5751)
“Teasing bits of information out of the CMB energy spectrum”, *MNRAS* 438, 2065, (2014)
45. **Jens Chluba**, Liang Dai & Marc Kamionkowski (arXiv:1308.5969)
“Multiple scattering Sunyaev-Zeldovich signal I: lowest order effect”, *MNRAS*, 437, 67, (2014)
44. **Jens Chluba** (arXiv:1304.6121)
“Distinguishing different scenarios of early energy release with spectral distortions of the cosmic microwave background”, *MNRAS*, 436, 2232, (2013)
43. **Jens Chluba** & Dan Grin (arXiv:1304.4596) “CMB spectral distortions from small-scale isocurvature fluctuations”, *MNRAS*, 434, 1619, (2013)
42. **Jens Chluba** (arXiv:1304.6120)
“Green’s function of the cosmological thermalization problem”, *MNRAS*, 434, 352, (2013)
41. C. Coppola, D. Galli, F. Palla, S. Longo & **Jens Chluba** (arXiv:1306.1107)
“Non-thermal photons and H₂ formation in the early Universe”, *MNRAS*, 434, 114, (2013)
40. Liang Dai, Donghui Jeong, Marc Kamionkowski & **Jens Chluba** (arXiv:1303.6949)
“The pesky power asymmetry”, *Phys. Rev. D*, 87, 123005, (2013)
39. Calabrese et al. (arXiv:1302.1841)
“Cosmological parameters from pre-planck cosmic microwave background measurements”, *Phys. Rev. D*, 87, 103012, (2013)
38. Marzieh Farhang, Dick Bond, **Jens Chluba**, & Eric R. Switzer (arXiv:1211.4634)
“Constraints on perturbations to the recombination history from measurements of the CMB damping tail”, *ApJ*, 764, 9, (2013)
37. **Jens Chluba**, Eric R. Switzer, Daisuke Nagai, & Kaylea Nelson (arXiv:1211.3206)
“Sunyaev-Zeldovich signal processing and temperature-velocity moment method for individual clusters”, *MNRAS*, 430, 3054, (2013)

36. **Jens Chluba**, Daisuke Nagai, Sergey Sazonov, & Kaylea Nelson
“A fast and accurate method for computing the Sunyaev-Zeldovich signal of hot galaxy clusters”, *MNRAS*, 426, 510, (2012)
35. **Jens Chluba**, Adrienne Erickcek, & Ido Ben-Dayan
“Probing the inflaton: Small-scale power spectrum constraints from measurements of the CMB energy spectrum”, *ApJ*, 758, 76 (2012)
34. **Jens Chluba**, Rishi Khatri & Rashid Sunyaev
“CMB at 2×2 order: The dissipation of primordial acoustic waves and the observable part of the associated energy release”, *MNRAS*, 425, 1129, (2012)
33. **Jens Chluba**, Jeffrey Fung & Eric R. Switzer
“Radiative transfer effects during primordial helium recombination”, *MNRAS*, 423, 3227, (2012)
32. Rishi Khatri, Rashid Sunyaev & **Jens Chluba**
“Mixing of blackbodies: entropy production and dissipation of sound waves in the early Universe”, *A&A*, 543, A136, (2012)
31. Marzieh Farhang, Dick Bond & **Jens Chluba**
“Semi-blind Eigen-analyses of Recombination Histories Using CMB Data”, *ApJ*, 752, 88, (2012)
30. Rishi Khatri, Rashid Sunyaev & **Jens Chluba**
“Does Bose-Einstein condensation of CMB photons cancel μ -distortions created by dissipation of sound waves in the early Universe?”, *A&A*, 540, A124, (2012)
29. **Jens Chluba** & Rashid Sunyaev
“The evolution of CMB spectral distortions in the early Universe”
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28. Gert Hütsi, **Jens Chluba**, Andi Hektor & Martti Raidal
“WMAP7 and future CMB constraints on annihilating dark matter: implications on GeV-scale WIMPs”, *A&A*, 535, 26, (2011)
27. **Jens Chluba**
“Fast and accurate computation of the aberration kernel for the CMB sky”
MNRAS, 415, 3227-3236, (2011)
26. Richard J. Shaw & **Jens Chluba**
“Precise cosmological parameter estimation using COSMOREC”
MNRAS, 415, 1343-1354, (2011)
25. **Jens Chluba** & Rajat M. Thomas
“Towards a complete treatment of the cosmological recombination problem”
MNRAS, 412, 748-764, (2011)
24. **Jens Chluba**, Geoff Vasil & Jonathan Dursi
“Recombinations to the Rydberg states of hydrogen and their effect during the cosmological recombination epoch”, *MNRAS*, 407, 599-612, (2010)
23. Jose Alberto Rubino-Martin, **Jens Chluba**, Chad Fendt & Benjamin Wandelt
“Estimating the impact of recombination uncertainties on the cosmological parameter constraints from cosmic microwave background experiments”, *MNRAS*, 403, 439-452, (2010)
22. **Jens Chluba** & Rashid Sunyaev
“Ly alpha escape during cosmological hydrogen recombination: the 3d-1s and 3s-1s two-photon processes”, *Astronomy & Astrophysics*, 512, A53, (2010)
21. **Jens Chluba** & Rashid Sunyaev
“Cosmological recombination: feedback of helium photons and its effect on the recombination spectrum”, *MNRAS*, 402, 1221-1248, (2010)

20. **Jens Chluba**
“Could the Cosmological Recombination Spectrum Help Us Understand Annihilating Dark Matter?”, *MNRAS*, 402, 1195-1207, (2010)
19. **Jens Chluba & Rashid Sunyaev**
“Cosmological hydrogen recombination: influence of resonance and electron scattering”
Astronomy & Astrophysics, 503, 345-355, (2009)
18. Rashid Sunyaev & **Jens Chluba** (arXiv:0908.0435)
“Signals from the epoch of cosmological recombination (Karl Schwarzschild Award Lecture 2008)”, *Astronomische Nachrichten*, 330, 657, (2009)
17. **Jens Chluba & Rashid Sunyaev**
“Pre-recombinational energy release and narrow features in the CMB spectrum”
Astronomy & Astrophysics, 501, 29-47, (2009)
16. Chad Fendt, **Jens Chluba**, Jose Alberto Rubino-Martin & Benjamin Wandelt
“RICO: A New Approach for Fast and Accurate Representation of the Cosmological Recombination History”, *ApJS*, 181, 627-638, (2009)
15. **Jens Chluba & Rashid Sunyaev**
“Time-dependent corrections to the Ly α escape probability during cosmological recombination”
Astronomy & Astrophysics, 496, 619-635, (2009)
14. **Jens Chluba & Rashid Sunyaev**
“Evolution of low-frequency features in the CMB spectrum due to stimulated Compton scattering and Doppler broadening”, *Astronomy & Astrophysics*, 488, 861-865, (2008)
13. Jose Alberto Rubino-Martin, **Jens Chluba & Rashid Sunyaev**
“Lines in the cosmic microwave background spectrum from the epoch of cosmological helium recombination”, *Astronomy & Astrophysics*, 485, 377-393, (2008)
12. **Jens Chluba & Rashid Sunyaev**
“Two-photon transitions in hydrogen and cosmological recombination”
Astronomy & Astrophysics, 480, 629-645, (2008)
11. **Jens Chluba & Rashid Sunyaev**
“Is there a need and another way to measure the Cosmic Microwave Background temperature more accurately?”, *Astronomy & Astrophysics*, 478, L27-L30, (2008)
10. **Jens Chluba & Rashid Sunyaev**
“Cosmological hydrogen recombination: Ly α line feedback and continuum escape”
Astronomy & Astrophysics, 475, 109-114, (2007)
9. **Jens Chluba**, Sergey Sazonov & Rashid Sunyaev
“Double Compton emission in an isotropic, mildly relativistic thermal plasma”
Astronomy & Astrophysics, 468, 785-795, (2007)
8. **Jens Chluba**, Jose Alberto Rubino-Martin & Rashid Sunyaev
“Cosmological hydrogen recombination: populations of the high level sub-states”
MNRAS, 374, 1310-1320, (2007)
7. **Jens Chluba & Rashid Sunyaev**
“Free-bound emission from cosmological hydrogen recombination”
Astronomy & Astrophysics Letters, 458, L29-L32, (2006)
6. Jose Alberto Rubino-Martin, **Jens Chluba & Rashid Sunyaev**
“Lines in the cosmic microwave background spectrum from the epoch of cosmological hydrogen recombination”, *MNRAS*, 371, 1939-1952, (2006)

5. Joern Dunkel, **Jens Chluba** & Rashid Sunyaev
“Accretion of helium and metal-rich gas onto neutron stars and black holes at high luminosities”
Astronomy Letters, 32, 257-262, (2006)
4. **Jens Chluba** & Rashid Sunyaev
“Induced two-photon decay of the 2s level and the rate of cosmological hydrogen recombination”, *Astronomy & Astrophysics*, 446, 39-42, (2006)
3. **Jens Chluba**, Gert Hütsi & Rashid Sunyaev
“Clusters of galaxies in the microwave band: influence of the motion of the Solar System”
Astronomy & Astrophysics, 434, 811-817, (2005)
2. **Jens Chluba** & Rashid Sunyaev
“Superposition of blackbodies and the dipole anisotropy: A possibility to calibrate CMB experiments”, *Astronomy & Astrophysics*, 424, 389-408, (2004)
1. **Jens Chluba** & Karl Mannheim
“Kinetic Sunyaev-Zeldovich effect from galaxy cluster rotation”
Astronomy & Astrophysics, 396, 419-427, (2002)

SUBMITTED

- Planck Collaboration (arXiv:1502.01594)
“Planck 2015 results. XIX. Constraints on primordial magnetic fields”, submitted to *A&A*
- Planck Collaboration (arXiv:1502.01589)
“Planck 2015 results. XIII. Cosmological parameters”, submitted to *A&A*
- Planck Collaboration (arXiv:1502.01582)
“Planck 2015 results. I. Overview of products and scientific results”, submitted to *A&A*
- Emanuela Dimastrogiovanni, Lawrence M. Krauss & **Jens Chluba** (arXiv:1512.09212)
“Constraints on Gravitino Decay and the Scale of Inflation using CMB spectral distortions”, submitted to *PRD*

CONTRIBUTED PUBLICATIONS

4. **Jens Chluba** (arXiv:1405.6938)
“Science with CMB spectral distortions”, to appear as Proceedings of the XLIXth RENCONTRES DE MORIOND
3. Rashid Sunyaev & **Jens Chluba**
“The Richness and Beauty of the Physics of Cosmological Recombination: the Contributions from Helium”, *Il Nuovo Cimento B*, vol. 122, Issue 9, p.919-934, (arXiv:0802.0772)
2. Rashid Sunyaev & **Jens Chluba**
“The Richness and Beauty of the Physics of Cosmological Recombination”
Frontiers of Astrophysics: A Celebration of NRAO’s 50th Anniversary ASP Conference Series, Vol. 395, Proceedings of the conference held 18-21 June, 2007, at the National Radio Astronomy Observatory, Charlottesville, Virginia, USA. Edited by Alan H. Bridle, James J. Condon, and Garteh C. Hunt., p.35, (arXiv:0710.2879)
1. **Jens Chluba**, Jose Alberto Rubino-Martin & Rashid Sunyaev
“The Cosmological Hydrogen Recombination Spectrum”
Proceedings of Bernard’s Cosmic Stories: from primordial fluctuations to the birth of stars and galaxies, June 26-30, 2006. UIMP, VALENCIA, SPAIN. Meeting abstracts

POPULAR SCIENCE ARTICLES

3. Contributed to the Article “Spectral Sensation” by George Musser
News Scan Cosmology
Scientific American, May 2009
2. **Jens Chluba** & Rashid Sunyaev
“What can the cosmological recombination radiation tell us about the thermal history of the Universe?” MPA Research Highlight, June 2008
1. Rashid Sunyaev & **Jens Chluba**
“Cosmological hydrogen recombination lines from redshifts $z \sim 1400$ ”
MPA Research Highlight, July 2007

LECTURESHIPS

- Invited Lecturer at the Ecole de Physique, Les Houches, Switzerland, April 2016
- Invited Lecturer at the ISAPP School 2015, Paris, France, June 2015
- CUSO Lecturer 2014, Geneva, Switzerland, Oct 16 - Nov 6, 2014
- Invited Lecturer at the Gif School 2014, Paris, France, Sept 8 - 12, 2014
- Invited Lecturer at the School on Cosmology Tools, Madrid, Spain, Nov 12 - 15, 2013
- Invited Lecturer at KEK Particle Phenomenology, Tsukuba, Japan, Sept 30 - Oct 3, 2013
- Invited Lecturer at the 100th Les Houches school on Post-Planck Cosmology, July/Aug, 2013

LIST OF RECENT INVITED AND CONTRIBUTED TALKS

- Contributed talk, Texas Symposium, Dec, 2015, Geneva, Switzerland
- Invited talk, Dutch Cosmology Meeting, Dec, 2015, Amsterdam, Netherlands
- Invited talk, KITPC workshop, Sept, 2015, Beijing, China
- Invited talk, Meeting on fundamental cosmology, June, 2015, Santander, Spain
- Invited talk, CMB@50, June, 2015, Princeton, USA
- Contributed talks, PIXIE Workshop, May, 2015, Chicago, USA
- Invited talk, MIAPP Workshop, Feb, 2015, Munich, Germany
- Contributed talk, Planck meeting, Dec, 2014, Ferrara, Italy
- Contributed talk, Zeldovich-100, June, 2014, Moskow, Russia
- Contributed talk, 9. Kosmologietag, May 2014, Bielefeld, Germany
- Invited talk, Rencontres de Moriond, March 2014, La Thuile, Italy

LIST OF RECENT SEMINARS AND COLLOQUIA

- JPL Colloquium, NASA JPL, Oct 2015, Pasadena, USA
- Cosmology Seminar, Oxford University, Oct 2015, Oxford, UK
- ITC Colloquium, Harvard University, Sept 2015, Cambridge, USA
- Cosmology Seminar, UC Boulder, August 2015, Boulder, USA
- Cosmology Seminar, Sussex, Apr 2015, Brighton, UK
- Cosmology Seminar, DAMPT, Jan 2015, Cambridge, UK

- Cosmology Seminar, ICG, Jan 2015, Portsmouth, UK
- Cosmology Seminar, ASU, Nov 2014, Phoenix, USA
- Cosmology Seminar, Penn State, Sept 2014, State College, USA
- Astrophysics Seminar, UPenn, April 2014, Philadelphia, USA
- Astrophysics Seminar, Purdue University, April 2014, Lafayette, USA
- Cosmology Seminar, KICP, April 2014, Chicago, USA
- Astrophysics Seminar, Case Western Reserve University, March 2014, Cleveland, USA
- Cosmology Seminar, University of Geneva, Feb 2014, Geneva, Switzerland