

# Curriculum Vitae

Prof. Dr. Kevin Heng

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Physics Institute  
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## Research Interests

Theory and simulation of exoplanetary atmospheres: fluid dynamics, radiative transfer, chemistry, inversion methods. Analytical methods in astrophysics. Applications of high performance computing. CHEOPS and exoplanet science. Pedagogy and epistemology.

Group Leader: Exoplanets & Exoclimates Group (4 postdocs, 5 Ph.D students)

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**Born: 23rd Sept 1978, Singapore**

## 1. Training, Education and Awards

### 1.1. Academic Positions

2015–present: Professor<sup>1</sup>, University of Bern

2013–2015: Tenure-Track Assistant Professor, University of Bern

2010–2012: Zwicky Prize Fellow, ETH Zürich, Institute for Astronomy

2009–2010: Frank & Peggy Taplin Member, Institute for Advanced Study at Princeton

2007–2009: Member, Institute for Advanced Study at Princeton

### 1.2. Visiting Positions

2007: Visitor, Max Planck Institutes for Astrophysics (MPA) and Extraterrestrial Physics (MPE)

### 1.3. Education

2007: Ph.D, astrophysics, JILA and University of Colorado at Boulder

2006: Chef Track Diploma, Culinary School of the Rockies, Colorado

2005: M.S., astrophysics, JILA and University of Colorado at Boulder

2003: B.Sc (Hons), physics, National University of Singapore

### 1.4. Awards, Honours & Prizes

2015: Delta Lecturer Award

2010–2012: Zwicky Prize Fellowship, ETH Zürich

2009–2010: Frank & Peggy Taplin Membership, Institute for Advanced Study at Princeton

2007: Martin & Beate Block Prize, Aspen Center for Physics

2003, 2004 & 2006: Graduate Fellowship (Departmental), University of Colorado at Boulder

2002: Pre-Graduate Award, Agency for Science, Technology and Research, Singapore

2000: Dean's List, National University of Singapore

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<sup>1</sup>The official title is *Ausserordentliche Professor* in the Swiss-German system, which is the equivalent of Associate Professor (with tenure) in the American system. I have not listed "Associate Professor" as the University of Bern uses this title at a level equivalent to *Titular Professor* (Research Professor).

### 1.5. Grants

- 2014–present: Swiss National Science Foundation, for the *Exoclines Simulation Platform* [0.4 MCHF]
- 2014–present: Sub-Project 5.2 Leader, PlanetS NCCR (National Center of Competence in Research), Swiss National Science Foundation (PI: W. Benz)
- 2013–2014: Swiss National Science Foundation, for the Exoclines III conference in Davos [6 kCHF]
- 2012–present: FONDATION MERAC, Switzerland, for the *Exoclines Simulation Platform* [0.5 MCHF]
- 2006: Sigma Xi, *Grants-in-Aid of Research* [1.5 kUSD]

### 1.6. Significant Mentors & Influences

Richard McCray, Scott Tremaine, Rashid Sunyaev, Sara Seager, Willy Benz, George Lake, Helmer Aslaksen

## 2. Service

### 2.1. Teaching Experience

- 2016: Invited lecturer, DPG Physics School on Exoplanets, Bad Honnef, Germany
- 2014–present: Advisor for 5 postdocs, 5 Ph.D students and 1 Masters student, Physics Institute, University of Bern
- 2013–present: Lecturer (with rank of habilitated Professor) for 3 Masters and 1 undergraduate courses, Physics Institute, University of Bern
- 2012, 2014: Host/advisor for ThinkSwiss Research Scholarship summer student (Peter Li, Greta Shum)
- 2011–2012: Supervision of 6 students for semester projects, Institute for Astronomy, ETH Zürich
- 2010–2012: Guest lecturer, introductory astronomy/astrophysics, Institute for Astronomy, ETH Zürich
- 2003–2006: Graduate teaching assistant, introductory astronomy/astrophysics, University of Colorado at Boulder
- 2003–2005: Guest lecturer, GRE Physics review lectures for astronomy/astrophysics undergraduates, University of Colorado at Boulder

### 2.2. Referee/Reviewer

#### 2.2.1. Grant Reviewer

- 2014: Netherlands Organisation for Scientific Research (NWO), Vidi scheme
- 2014: NASA Astrophysics Theory Program (ATP; Non-panelist)
- 2014: NASA Exoplanets Research Program (XRP; Panelist)
- 2013: NASA Postdoctoral Program
- 2013: Swiss National Science Foundation (SNSF)
- 2013: (U.S.) National Science Foundation (NSF) *TCAN* Program (Non-panelist)
- 2013–2014: French National Research Agency (ANR)
- 2013–2015: Research Foundation - Flanders (FWO)
- 2012: (British) Royal Society *University Research Fellowship* Program
- 2012: U.S.-Israel Binational Science Foundation
- 2012: NASA ROSES *Astrophysics Theory* Program (Panelist)
- 2012–2013: NASA ROSES *Origins of Solar Systems* Program (Non-panelist)

#### 2.2.2. Journal Editor

- 2015–present: Handling Editor, *Molecular Astrophysics* (Editor-in-Chief: A. Tielens)

### 2.2.3. Journal Referee

2013–present: *Science*  
 2013–present: *International Journal of Astrobiology*  
 2012–present: *Planetary & Space Science*  
 2012–present: *Geophysical & Astrophysical Fluid Dynamics*  
 2012–present: *Icarus*  
 2012–present: *Astronomical Journal*  
 2011–present: *Monthly Notices of the Royal Astronomical Society*  
 2008–present: *Astronomy & Astrophysics*  
 2006–present: *Astrophysical Journal*

### 2.3. Missions and Telescopes

2014–present: University of Bern representative for the HIRES spectrograph on the E-ELT  
 2013–present: PLATO mission (PI: H. Rauer) approved by ESA  
 2012–present: Core science team, CHEOPS mission (PI: W. Benz) approved by ESA  
 2012: EChO mission proposed to ESA

### 2.4. Committees

2015: SOC member, OHP (Observatoire de Haute Provence) conference  
 2015: SOC member, PLATO atmospheric science workshop, DLR Berlin  
 2014–present: Treasurer, Swiss Society for Astronomy & Astrophysics (SSAA)  
 2014–2016: SOC and LOC chair, Exoplanets I conference, Davos, Switzerland  
 2014–2015: SOC member and LOC chair, Pathways to Habitability II, Bern, Switzerland  
 2014: Ph.D thesis committee of Monika Lendt, Geneva Observatory, Switzerland  
 2012–2014: SOC member and LOC chair, Exoclimates III conference, Davos, Switzerland  
 2011: External Opponent (Ph.D thesis examiner), DARK Cosmology Centre, Copenhagen, Denmark  
 2006: Member, faculty search committee, Department of Astrophysical & Planetary Sciences, University of Colorado at Boulder, U.S.A.  
 2006: Member, Ph.D student admissions committee, Department of Astrophysical & Planetary Sciences, University of Colorado at Boulder, U.S.A.

### 2.5. Societies

2012–present: Zürich Minds  
 2012–present: Member, International Astronomical Union (IAU)  
 2006–present: Member, Sigma Xi: The Scientific Research Society

### 2.6. Outreach

2015–present: Member, board of advisors, Swiss Space Museum  
 2014: *Nova: Alien Planets Revealed*, PBS, Season 41, Episode 10, directed by N. Williams and B. Bowie, with contributions from N. Batalha, D. Charbonneau, K. Heng, G. Marcy, C. McKay, S. Seager et al.  
 2013–present: Columnist, *Perspective* (formerly *Marginalia*) section of *American Scientist* magazine

### 2.7. Selected Grants for Telescope Time (as Consulting Theorist/Phenomenologist)

2014: *Bright Hot Jupiters: Phase Curves and Doppler Spectroscopy*, Spitzer Space Telescope, Co-I (PI: Crossfield), Cycle 11

2013: *A Homogeneous Phase Curve Sample for Global Atmospheric Retrieval*, Spitzer Space Telescope, Co-I (PI: Crossfield), Cycle 10

2012: *Atmospheric composition and inflation of the “warm” Jupiter WASP-80b*, VLT-CRIRES, Co-I (PI: Triaud), Period 91

2012: *Full-orbit atmospheric characterisation of a gas giant transiting an M dwarf*, Spitzer Space Telescope, Co-I (PI: Triaud), Cycle 9

2012: *Measuring the albedo of HD 189733b at optical wavelengths*, Hubble Space Telescope, Co-I (PI: Pont), Cycle 20

2012: *The first transmission spectrum of an eccentric cool Jupiter, HAT-P-17-b*, Hubble Space Telescope, Co-I (PI: Huitson), Cycle 20

2010: *IFU observations of shocks in the nova FH Ser*, VLT-VIMOS, Co-I (PI: van de Ven), Period 87

2009–2012: *IFU observations of shocks in SN 1006*, VLT-VIMOS, Co-I, Periods 85 (PI: van de Ven) and 89 (PI: Nikolić)

2006–2009: *Multi-band imaging and spectroscopy of SN 1987A*, Hubble Space Telescope, Co-I (PI: Kirshner), SAINTS team, Cycles 15–18

### 2.8. Other Professional Experiences

1998–1999: Journalist, producer and sound engineer, Power 98.0 FM, Singapore

1997–1998: Logistics specialist, infantry division, Singapore Armed Forces

## 3. Publications

### 3.1. Refereed/Peer-Reviewed Papers (since 2005)

**27 first author (4 single author), 5 second author, 6 third author, 10 N-th author ( $N > 3$ ).**

**Citations: 1000+. h-index: 20 (using ADS).**

48. *Atmospheric Chemistry for Astrophysicists: A Self-consistent Formalism and Analytical Solutions for Arbitrary C/O*, K. Heng, J.R. Lyons, & S.-M. Tsai, 2015, *Astrophysical Journal*, submitted
47. *HELIOS-K: An Ultrafast, Open-source Opacity Calculator for Radiative Transfer*, S.L. Grimm & K. Heng, 2015, *Astrophysical Journal*, in press
46. *The Destruction of the Circumstellar Ring of SN 1987A*, C. Fransson et al., 2015, *Astrophysical Journal Letters*, 806, L19
45. *WASP-80b has a dayside within the T-dwarf range*, A.H.M.J. Triaud et al., 2015, *Monthly Notices of the Royal Astronomical Society*, 450, 2279
44. *A Non-isothermal Theory for Interpreting Sodium Lines in Exoplanetary Atmospheres*, K. Heng, A. Wyttenbach, B. Lavie, D.K. Sing, D. Ehrenreich & C. Lovis, 2015, *Astrophysical Journal Letters*, 803, L9
43. *Mapping High-velocity H $\alpha$  and Ly $\alpha$  Emission from Supernova 1987A*, K. France et al., 2015, *Astrophysical Journal Letters*, 801, L16
42. *Can we constrain the interior structure of rocky exoplanets from mass and radius measurements?*, C. Dorn, A. Khan, K. Heng, Y. Alibert, J.A.D. Connolly, W. Benz & P. Tackley, 2015, *Astronomy & Astrophysics*, 577, A83

41. *Atmospheric Dynamics of Hot Exoplanets*, K. Heng & A.P. Showman, 2015, *Annual Review of Earth and Planetary Sciences*, 43, 509
40. *High Resolution Transmission Spectroscopy as a Diagnostic for Jovian Exoplanet Atmospheres: Constraints from Theoretical Models*, E. M.-R. Kempton, R. Perna & K. Heng, 2014, *Astrophysical Journal*, 795, 24
39. *Analytical Models of Exoplanetary Atmospheres. II. Radiative Transfer via the Two-Stream Approximation*, K. Heng, J.M. Mendonça & J.-M. Lee, 2014, *Astrophysical Journal Supplements*, 215, 4
38. *Analytical Models of Exoplanetary Atmospheres. I. Atmospheric Dynamics via the Shallow Water System*, K. Heng & J. Workman, 2014, *Astrophysical Journal Supplements*, 213, 27
37. *Constraining the Atmospheric Composition of the Day-Night Terminators of HD 189733b: Atmospheric Retrieval with Aerosols*, J.-M. Lee et al., 2014, *Astrophysical Journal*, 789, 14
36. *The PLATO 2.0 Mission*, H. Rauer et al., 2014, *Experimental Astronomy*, 38, 249
35. *Atmospheric Retrieval Analysis of the Directly Imaged Exoplanet HR 8799b*, J.-M. Lee, K. Heng & P.G.J. Irwin, 2013, *Astrophysical Journal*, 778, 97
34. *Understanding Trends Associated with Clouds in Irradiated Exoplanets: Analytical Models*, K. Heng & B.-O. Demory, 2013, *Astrophysical Journal*, 777, 100
33. *Inference of Inhomogeneous Clouds in an Exoplanet Atmosphere*, B.-O. Demory et al., 2013, *Astrophysical Journal Letters*, 776, L25
32. *The Deep Blue Color of HD 189733b: Albedo Measurements with Hubble Space Telescope/Space Telescope Imaging Spectrograph at Visible Wavelengths*, T. Evans, et al., 2013, *Astrophysical Journal Letters*, 772, L16
31. *Debris discs around M stars: non-existence versus non-detection*, K. Heng & M. Malik, 2013, *Monthly Notices of the Royal Astronomical Society*, 452, 2562
30. *An Integral View of Fast Shocks around Supernova 1006* S. Nikolić, G. van de Ven, K. Heng, D. Kupko, B. Husemann, J.C. Raymond, J.P. Hughes & J. Falcón-Barroso, 2013, *Science*, 340, 45
29. *On the Existence of Shocks in Irradiated Exoplanetary Atmospheres*, K. Heng, 2012, *Astrophysical Journal Letters*, 761, L1
28. *On the Stability of Super Earth Atmospheres*, K. Heng & P. Kopparla, 2012, *Astrophysical Journal*, 754, 60
27. *The Effects of Irradiation on Hot Jovian Atmospheres: Heat Redistribution and Energy Dissipation*, R. Perna, K. Heng & F. Pont, 2012, *Astrophysical Journal*, 751, 59
26. *Excitation and charge transfer in hydrogen-proton collisions at 5–80 keV and application to astrophysical shocks*, D. Tseliakhovich, C.M. Hirata & K. Heng, 2012, *Monthly Notices of the Royal Astronomical Society*, 422, 2357
25. *The Influence of Atmospheric Scattering and Absorption on Ohmic Dissipation in Hot Jupiters*, K. Heng, 2012, *Astrophysical Journal Letters*, 748, L17
24. *EChO - Exoplanet Characterisation Observatory*, G. Tinetti et al., 2012, *Experimental Astronomy*, 34, 311

23. *On the effects of clouds and hazes in the atmospheres of hot Jupiters: semi-analytical temperature-pressure profiles*, K. Heng, W. Hayek, F. Pont & D.K. Sing, 2012, Monthly Notices of the Royal Astronomical Society, 420, 20
22. *HST-COS Observations of Hydrogen, Helium, Carbon and Nitrogen Emission from the SN 1987A Reverse Shock*, K. France et al., 2011, Astrophysical Journal, 743, 186
21. *Atmospheric circulation of tidally-locked exoplanets: II. Dual-band radiative transfer and convective adjustment*, K. Heng, D.M.W. Frierson & P.J. Phillipps, 2011, Monthly Notices of the Royal Astronomical Society, 418, 2669
20. *X-ray illumination of the ejecta of supernova 1987A*, J. Larsson et al., 2011, Nature, 474, 484
19. *Estimating the mass of the debris disk in HD 69830*, K. Heng, 2011, Monthly Notices of the Royal Astronomical Society, 415, 3365
18. *The Dependence of Brown Dwarf Radii on Metallicity and Clouds: Theory and Comparison with Observations*, A. Burrows, K. Heng & T. Nampaisarn, 2011, Astrophysical Journal, 736, 47
17. *Gliese 581g as a scaled-up version of Earth: atmospheric circulation simulations*, K. Heng & S.S. Vogt, 2011, Monthly Notices of the Royal Astronomical Society, 415, 2145
16. *Atmospheric circulation of tidally-locked exoplanets: a suite of benchmark tests for dynamical solvers*, K. Heng, K. Menou & P.J. Phillipps, 2011, Monthly Notices of the Royal Astronomical Society, 413, 2380
15. *Observing Supernova 1987A with the Refurbished Hubble Space Telescope*, K. France et al., 2010, Science, 329, 1624
14. *Vortices as Nurseries for Planetesimal Formation in Protoplanetary Discs*, K. Heng & S.J. Kenyon, 2010, Monthly Notices of the Royal Astronomical Society, 408, 1476
13. *Balmer-Dominated Shocks: A Concise Review*, K. Heng, 2010, Publications of the Astronomical Society of Australia, 27, 23
12. *Long-Lived Planetesimal Discs*, K. Heng & S. Tremaine, 2010, Monthly Notices of the Royal Astronomical Society, 401, 867
11. *Planetesimal Disk Microlensing*, K. Heng & C.R. Keeton, 2009, Astrophysical Journal, 707, 621
10. *Magnetohydrodynamic Shallow Water Waves: Linear Analysis*, K. Heng & A. Spitkovsky, 2009, Astrophysical Journal, 703, 1819
9. *Spatial Structure and Collisionless Electron Heating in Balmer-dominated Shocks*, M.I. van Adelsberg et al., 2008, Astrophysical Journal, 689, 1089
8. *A Direct Measurement of the Dust Extinction Curve in an Intermediate-Redshift Galaxy*, K. Heng et al., 2008, Astrophysical Journal, 681, 1116
7. *Probing Elemental Abundances in SNR 1987A using XMM-Newton*, K. Heng et al., 2008, Astrophysical Journal, 676, 361
6. *Broad Ly $\alpha$  Emission from Supernova Remnants*, K. Heng & R. Sunyaev, 2008, Astronomy & Astrophysics, 481, 117
5. *The Transition Zone in Balmer-Dominated Shocks*, K. Heng et al., 2007, Astrophysical Journal, 668, 275

4. *Dust Echoes from the Ambient Medium of Gamma-Ray Bursts*, K. Heng, D. Lazzati & R. Perna, 2007, *Astrophysical Journal*, 662, 1119
3. *Balmer-Dominated Shocks Revisited*, K. Heng & R. McCray, 2007, *Astrophysical Journal*, 654, 923
2. *Evolution of the Reverse Shock Emission from SNR 1987A*, K. Heng et al., 2006, *Astrophysical Journal*, 644, 959
1. *The Reverse Shock of SNR 1987A at 18 Years after Outburst*, N. Smith et al. 2005, *Astrophysical Journal Letters*, 635, L41

### 3.2. Conference Proceedings and White Papers

Note: conference abstracts are excluded

8. *Characterising exoplanets and their environment with UV transmission spectroscopy*, L. Fossati et al., 2015, *Hubble's 2020 Vision* (arXiv:1503.01278)
7. *HIRES: the high resolution spectrograph for the E-ELT*, F.M. Zerbi et al., 2014, *Proceedings of the SPIE*, 9147, 914723
6. *An Integral View of Balmer-dominated Shocks in Supernova Remnants*, S. Nikolić, G. van de Ven, Glenn, K. Heng, D. Kupko, J. Méndez-Abreu, J.A.L. Aguerri, J. Font Serra & J. Beckman, 2013, *Proceeding for the IAU Symposium 296*, 165
5. *The Exoplanet Characterization Observatory (EChO): performance model EclipseSim and applications*, R. van Boekel et al., 2012, *Proceedings of the SPIE*, 8442, 84421F
4. *The Science of EChO*, G. Tinetti et al., 2011, *Proceedings of the International Astronomical Union Symposium*, 276, 359
3. *Challenges Facing Young Astrophysicists*, N. Zakamska et al., 2010, *Astro2010: the Astronomy and Astrophysics Decadal Survey*, Position Papers, no. 69
2. *The Reverse Shock of SNR 1987A*, K. Heng, 2007, *American Institute of Physics Conference Proceedings*, 937, 51, *Supernova 1987A: 20 Years After (Supernovae & Gamma-Ray Bursters)*, Aspen Center for Physics, eds. S. Immler, K.W. Weiler and R. McCray
1. *Bolocam: status and observations*, D.J. Haig et al., 2004, *Proceedings of the SPIE*, 5498, 78

### 3.3. Popular Science Articles

‡: edited by Katie Burke †: edited by Fenella Saunders

7. *La naturaleza de la prueba científica en la era de las simulaciones*, K. Heng (translated), 2015, *Investigación y Ciencia*, May 2015 Issue, Pages 42–46
6. *The Next Great Exoplanet Hunt*‡, K. Heng & J. Winn, 2015, *American Scientist*, Feature Article, Volume 103, Number 3, Pages 196–203
5. *The Nature of Scientific Proof in the Age of Simulations*‡, K. Heng, 2014, *American Scientist*, Perspective Column, Volume 102, Number 3, Pages 174–177
4. *Why Does Nature Form Exoplanets Easily?*†, K. Heng, 2013, *American Scientist*, Marginalia Column, Volume 101, Number 3, Pages 184–187

3. *Das Klima auf fremden Welten*, K. Heng (translated), 2013, Spektrum der Wissenschaft, February 2013 Issue, Pages 46–53
2. *Le climat des exoplanètes*, K. Heng (translated by Sean Bailly), 2012, Pour la Science, Volume 421, Pages 40–46
1. *The Study of Climate on Alien Worlds<sup>†</sup>*, K. Heng, 2012, American Scientist, Feature Article, Volume 100, Number 4, Pages 334–341

#### 4. Selected Colloquia, Seminars & Popular Talks

##### 4.1. Exoplanets

30. *Analytical Diagnostics for Interpreting Sodium Lines in Exoplanetary Atmospheres*, contributed talk, CHEOPS Science Workshop, Madrid, Spain (2015)
29. *Exoplanet Atmospheres: Theory & Simulation*, invited colloquium, Institut de Planétologie et d'Astrophysique de Grenoble (IPAG), France (2014)
28. *Radiative Transfer in Exoplanet Atmospheres*, exoplanet group seminar (invited), Cambridge University, England (2014)
27. *Exoplanet Atmospheres: Theory & Simulation*, Cavendish astrophysics seminar (invited), Cambridge University, England (2014)
26. *Exoplanet Atmospheres: Theory & Simulation*, invited colloquium, Leiden University, Netherlands (2014)
25. *Exoplanet Atmospheres: Theory & Simulation*, invited review, Planet Formation and Evolution Workshop, Kiel University, Germany (2014)
24. *The Relevance of Optical Data for Understanding Exoplanetary Atmospheres*, invited review, joint CoRoT-Kepler meeting, Toulouse, France (2014)
23. *Exoplanet Atmospheres: Theory & Simulation*, invited colloquium, Institut d'Astrophysique de Paris (IAP), France (2014)
22. *Exoplanetary Atmospheres*, invited lecture, Annual Member Lecture of the Swiss chapter of Sigma Xi, Bern, Switzerland (2013)
21. *What Can We Learn About Exoplanetary Atmospheres in the Optical?*, contributed talk, PLATO 2.0 Science Workshop, ESTEC, Netherlands (2013)
20. *Exoplanetary Atmospheres and Climates: Theory and Simulation*, invited seminar, Lund University (2013)
19. *The Exoplanets and Exoclimates Group at the University of Bern*, invited talk for the Helmholtz Alliance, DLR, Berlin (2013)
18. *What Can We Learn About Exoplanetary Atmospheres in the Optical?*, contributed talk, 1st CHEOPS Science Meeting, Bern, Switzerland (2013)
17. *Exoplanets*, invited talk, Zurich Minds flagship event<sup>2</sup> (2012)

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<sup>2</sup>Speakers included Gerhard Schroeder and John Gray.



16. *The Study of Climate on Alien Worlds: a Hierarchical Approach to Understanding the Atmospheres of Exoplanets*, invited seminar, Geneva Observatory (2012)
15. *Atmospheric Dynamics of Hot Jupiters and Super Earths*, contributed talk at *Characterizing and Modeling Extrasolar Planetary Atmospheres* conference, Max Planck Institute for Astronomy, Heidelberg (2012)
14. *The Study of Climate on Alien Worlds: a Hierarchical, Multi-Disciplinary Approach to Understanding the Atmospheres of Exoplanets*, invited talk, Centre for Space and Habitability, University of Bern (2012)
13. *A Hierarchical Approach to Understanding Exoplanetary Atmospheres: from 1D Models to 3D Simulations*, invited colloquium, Anton Pannekoek Institute, University of Amsterdam (2012)
12. *The Effects of Irradiation on Hot Jovian Atmospheres*, contributed talk at *Exoclimes II* conference, Aspen Center for Physics (2012)
11. *A Hierarchical Approach to Understanding Exoplanetary Atmospheres: from 1D Models to 3D Simulations*, invited seminar, JILA, University of Colorado (2012)
10. *A Hierarchical Approach to Understanding Hot Jovian Atmospheres: from 1D Models to 3D Simulations*, invited talk at GCM workshop, Exeter University (2011)
9. *A Hierarchical Approach to Understanding Hot Jovian Atmospheres: from 1D Models to 3D Simulations*, invited talk at University College London (2011)
8. *Review of Astrophysical Theory of Exoplanetary Atmospheres*, review talk at *Planet-Z: The Atmospheres and Interiors of (Exo)planets*, ETH Zürich (2011)
7. *Joint Constraints on the Atmospheric Chemistry, Dynamics and Temporal Signatures of HD 189733b: Combining Abundance Retrieval with 3D Simulations*, contributed talk at EPSC-DPS Joint Meeting, Nantes (2011)
6. *Joint Constraints on the Atmospheric Chemistry, Dynamics and Temporal Signatures of HD 189733b: Combining Abundance Retrieval with 3D Simulations*, contributed talk at *Extreme Solar Systems II* conference, Wyoming (2011)
5. *A Hierarchical Approach to Understanding Hot Jovian Atmospheres: from 1D Models to 3D Simulations*, invited seminar at Harvard Institute for Theory & Computation (ITC; 2011)
4. *A Hierarchical Approach to Modeling Hot Jovian Atmospheres: from 1D Models to 3D Simulations*, invited seminar at Exeter University (2011)
3. *The Study of Climate on Alien Worlds: Atmospheric Circulation Simulations of Extrasolar Planets*, contributed talk at EChO workshop, Paris-Meudon (2011)
2. *The Study of Climate on Alien Worlds: Atmospheric Circulation Simulations of Extrasolar Planets*, invited talk at Exeter University (2011)
1. *Exoplanetary Astrophysics: Vortices, Atmospheres and Debris Disks*, invited seminar at the Space Telescope Science Institute (2010)

#### 4.2. Others

10. *Balmer-Dominated Shocks: a 3D View from IFU Spectroscopy*, invited talk at the *Explosive Ideas about Massive Stars* conference, AlbaNova University Center, Stockholm (2011)
9. *Planetesimal and Debris Disks: the Late Stages of Planetary Systems*, invited talk at the *Exoplanets for Planetary Scientists* conference, University of Central Florida (2010)
8. *Long-Lived Planetesimal Disks*, invited seminar at Columbia University (2009)
7. *Long-Lived Planetesimal Disks*, invited colloquium at Rutgers University (2009)
6. *Balmer-Dominated Shocks: A Concise Review*, invited review at *Rogersfest: A Festival of Cosmic Explosions*, Caltech (2009)
5. *A Simple Theory of Hydrogen Shocks*, invited colloquium at Stanford University and SLAC (2008)
4. *A Simple Theory of Hydrogen Shocks*, invited talk at the *Supernovae & Gamma-Ray Bursts at Low z in the Era of Reionization* conference, Darjeeling, India (2008)
3. *Basics of Shocks*, invited lecture at the *Supernovae & Gamma-Ray Bursts at Low z in the Era of Reionization* summer school, Darjeeling, India (2008)
2. *Balmer-Dominated Supernova Remnants (and Beyond)*, invited colloquium at Rutgers University (2007)
1. *The Reverse Shock of SNR 1987A*, invited talk at the *Supernova 1987A: 20 Years After (Supernovae & Gamma-Ray Bursters)* winter conference, Aspen Center for Physics (2007)

#### 5. Postdocs & Students

- Postdocs (University of Bern): Jaemin Lee (2012–2015; Ph.D, Oxford), Joao Mendonca (2013–present; Ph.D, Oxford), Daniel Kitzmann (2014–present; Ph.D, Berlin)<sup>3</sup>, Simon Grimm (2015–present; Ph.D, Zürich)<sup>4</sup>, Frank Wagner (2015–present; Ph.D, Berlin)<sup>5</sup>
- Informal postdocs (University of Bern): Caroline Dorn (2013–present; Ph.D, Lausanne)<sup>6</sup>
- Ph.D students (University of Bern): Luc Grosheintz (2014–present), Matej Malik (2014–present), Baptiste Lavie (2014–present)<sup>7</sup>, Shang-Min Tsai (2014–present), Maria Oreshenko (2015–present)
- Masters students (University of Bern): Maria Oreshenko (2015)<sup>8</sup>
- Undergraduate semester projects (ETH Zürich): David von Rickenbach (2011), Felix Huber (2012), Constantin Heidegger (2012), Yannick Boetzel (2012), Carsten Heinrich (2012), Matej Malik (2012)
- Summer students (ETH Zürich): Peter Li (2012; now at UCLA for Ph.D)
- Informal students (ETH Zürich): Pushkar Kopparla (2012; now at Caltech for Ph.D)

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<sup>3</sup>Joint with Yann Alibert.

<sup>4</sup>Joint with Ben Moore

<sup>5</sup>Joint with Paul Tackley as part of the PlanetS NCCR.

<sup>6</sup>Willy Benz's postdoc.

<sup>7</sup>Joint with David Ehrenreich as part of the PlanetS NCCR.

<sup>8</sup>External thesis at University of Bern from ETH Zürich.