Marius Lehmann

Curriculum Vitae

General Information

Date of Birth	October/01/1986
Nationality	Germany
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Adress	ASIAA, No. 1, Roosevelt Rd, Sec. 4, Taipei 10617, R.O.C., Taiwan.

Education

2004–2008 **Studies in Physics**, *RWTH Aachen University*, Aachen, Germany.
Emphasis: Particle Physics

2008–2013 **Studies in Physics**, *University of Potsdam*, Potsdam, Germany.
Emphasis: Astronomy, Nonlinear Dynamics · Diploma (equivalent to Master's degree): *first class grades*

2014–2018 **PhD in Astronomy**, *University of Oulu*, Oulu, Finland.
Waves in planetary rings: Hydrodynamic modeling of resonantly forced density waves and viscous overstability in Saturn's rings (*pass with distinction*)

2020–Now **Postdoctoral research fellow**, *ASIAA*, Taipei, Taiwan.
Dust and gas instabilities in protoplanetary discs

Publications

- J. Schmidt, J.-E. Colwell, M. Lehmann, E.-A. Marouf, H. Salo, F. Spahn, M.-S. Tiscareno: *On the linear damping relation for density waves in Saturn's rings*, ApJ **824**, 33 (2016).
- M. Lehmann, J. Schmidt, H. Salo: *A Weakly Nonlinear Model for the Damping of Resonantly Forced Density Waves in Dense Planetary Rings*, ApJ **829**, 75 (2016).
- M. Lehmann, J. Schmidt, H. Salo: *Viscous Overstability in Saturn's Rings: Influence of collective Self-Gravity*, ApJ **851**, 125 (2017).
- M. Lehmann, J. Schmidt, H. Salo: *Density Waves and the Viscous Overstability in Saturn's Rings*, A&A **623**, A121 (2019).
- M. Lehmann, M. K. Lin: *Impact of local pressure enhancements on dust concentration in turbulent protoplanetary discs*, A&A **658**, A156 (2022).

- M. Lehmann, M. K. Lin: *Instabilities in dusty non-isothermal protoplanetary discs*, MNRAS **522**, 5892L (2023).
- K. Gerbig, M. K. Lin, M. Lehmann: *Filament formation due to diffusive instabilities in dusty protoplanetary disks*, ApJ, accepted.
- M. Lehmann, H. Salo: *Viscous overstability in dense planetary rings - Effect of vertical motions and dense packing*, MNRAS, accepted.

Conferences / Summer schools / Workshops

26.–28.5.2014 **Astronomers' Days 2014 (Finnish Astronomical Society)**, Savonlinna, Finland.
Given talk: Modeling of Satellite Induced Density Waves in Dense Planetary Rings

1.–5.9.2014 **Modern statistical methods for natural scientists**, University of Oulu, Finland.
Attending lectures on various topics such as Parametric modelling, Analysis of Error and Time Series Analysis.
Solving practical problems with the R environment for statistical computing.

7.–12.9.2014 **EPSC 2014 (Copernicus)**, Estoril, Portugal.
Given talk: Modeling of Satellite Induced Density Waves in Dense Planetary Rings

26.–28.8.2015 **FinCOSPAR Meeting 2015 (Finnish space research community)**, Sodankylä, Finland.
Given talk: Modeling of Satellite Induced Density Waves in Dense Planetary Rings

29.–31.3.2016 **Physics Days 2016 (Finnish Physical Society)**, Oulu, Finland.
Given talk: Nonlinear Dynamics of Density Waves in Saturn's Rings

16.–21.10.2016 **DPS/EPSC 2016 (AAS)**, Pasadena, CA.
Poster: Damping of Nonlinear Density Waves in Dense Planetary Rings

7.–12.11.2016 **Methods of observational astrophysics**, University of Turku, Finland.
Planning and carrying-out observations with a professional telescope.
Running the commonly used astronomical data reduction and analysis software to produce fully reduced calibrated data of the most common observing modes.
Analyzing the data and reporting the results in the context of the relevant astrophysical science question. Producing a written report.

11.–15.6.2017 **DDA meeting 2017 (AAS)**, London, United Kingdom.
Given talk: The Role of Collective Self-Gravity in the Nonlinear Evolution of Viscous Overstability in Saturn's Rings

17.–22.9.2017 **EPSC 2017 (Copernicus)**, Riga, Latvia.
Convener of the Planetary Rings session
Given talk: The Role of Collective Self-Gravity in the Nonlinear Evolution of Viscous Overstability in Saturn's Rings

24.–26.1.2022 **Annual Meeting of the Physical Society of Taiwan**, Taipei, Taiwan.
Presented poster: Instabilities in dusty, non-isothermal protoplanetary disks

10.–15.4.2022 **Protostars and planets VII meeting**, Kyoto, Japan.
Presented poster: Instabilities in dusty, non-isothermal protoplanetary disks

15.–19.8.2022 **NCTS-ASIAA Workshop: Stars, Planets, and Formosa** , Taipei, Taiwan.
Given talk: Dust concentration in pressure bumps in turbulent protoplanetary disks

26.–30.9.2022 **East Asian Numerical Astrophysics Meeting 9** , Okinawa, Japan.
Given online talk: Dust concentration in pressure bumps in turbulent protoplanetary disks

8.11.2022 **VSI 2022 meeting**, Copenhagen, Denmark.
Given online talk: Dust concentration in pressure bumps in turbulent protoplanetary disks

13.11.2023 **TCAN 2023 meeting**, Tucson, AZ.
Given online talk: Radially global convective overstability in protoplanetary disks

7.12.2023 **Colloquium**, CAG, NTNU, Taiwan.
Impact of hydrodynamic instabilities on dust concentration in protoplanetary discs

Successfully Applied Grants

1.8.–1.11.2018 **University of Oulu Scholarschip Foundation Grant**, University of Oulu, Finland.
Funding for three months full time PhD work.

Academic Services

Referee for the Astrophysical Journal.

Professional Memberships

International Astronomical Union.

Teaching

2012–2013 **Tutor in Experimental Physics**, *Department of Physics and Astronomy, University of Potsdam*, Potsdam, Germany.
Correcting the students' homework problems.
Discussing the homework problems in class.
Reference: Prof. P. Richter · prichter@astro.physik.uni-potsdam.de

09.2014–12.2014 **Teaching assistant in Nonlinear Dynamics**, *Department of Physics, University of Oulu*, Oulu, Finland.
Correcting the students' homework problems.
Discussing the homework problems in class.
Reference: Prof. J. Schmidt · juergen.schmidt@fu-berlin.de

02.2016–05.2016 **Teaching assistant in Nonlinear Dynamics**, *Department of Physics, University of Oulu*, Oulu, Finland.
Correcting the students' homework problems.
Discussing the homework problems in class.
Reference: Prof. J. Schmidt · juergen.schmidt@fu-berlin.de

Miscellaneous

2009–2010 **Research Assistant**, *Institute of Earth and Environmental Science, University of Potsdam*, Potsdam, Germany.
The task was to determine first onset arrival times on waveforms of earthquakes at large distances recorded by 12 broadband ocean bottom seismometers deployed west of Svalbard in the Arctic Ocean, and to compare the observed travel times with the expected ones calculated from a standard Earth model. The work was carried out to support the search for active faults near the Barents shelf in 2007 and 2008 in the framework of the International Polar Year research activities. Reference: Prof. F. Krüger · frank.krueger@geo.uni-potsdam.de

References

ASIAA, NCTS — **Dr. Min-Kai Lin**, *Institute of Astronomy and Astrophysics, Academia Sinica, 11F of Astronomy-Mathematics Building, No.1, Sec. 4, Roosevelt Rd, Taipei 10617, Taiwan.*
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Email: mklin@asiaa.sinica.edu.tw

FU Berlin — **Prof. Jürgen Schmidt**, *Department of Earth Sciences, Institute of Geological Sciences, Malteserstr. 74-100, Building D, 12249 Berlin, Germany.*
Tel: +49-30-838-71050
Email: juergen.schmidt@fu-berlin.de

University of Cambridge — **Prof. Henrik N. Latter**, *AFD group, DAMTP, Wilberforce Rd, Cambridge CB3 0WA, United Kingdom.*
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