Contact information

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Employment

Niels Bohr Institute, UCPH Sep 2023 – Aug 2025
Marie Skłodowska-Curie Fellow

Leibniz-Institut für Astrophysik Potsdam (AIP) Dec 2020 – July 2023
Independent postdoc fellow in Cosmology and High-energy Astrophysics

Leibniz-Institut für Astrophysik Potsdam (AIP) Dec 2017 – Nov 2020
ERC-funded postdoc with Professor Christoph Pfrommer

Education

Niels Bohr Institute, UCPH Nov 2014 – Oct 2017
The PhD degree was awarded on November 6th, 2017.

University of California, Berkeley Aug 2016 – Oct 2016
Visiting PhD fellow at the Theoretical Astrophysics Center

University of Copenhagen Feb 2012 – Sep 2014
Master of Science in Physics
GPA: 11.3/12. Thesis grade: 12/12

University of Utrecht Sep 2012 – Feb 2013
Erasmus exchange student

The European Organization for Nuclear Research, CERN Jun 2012 – Aug 2012
CERN summer student

University of Copenhagen Sep 2008 – Jan 2012
Bachelor of Science in Physics GPA: 10.9/12. Thesis grade: 12/12

Organisational Skills

- Co-organiser of the 7th ICM Theory and Computation Workshop, June 24-28, 2024
- Main organiser of the 6th ICM Theory and Computation Workshop, August 15-19, 2022
- Co-organiser of weekly astro-ph meeting at AIP, 2019-2022
- Organiser of weekly "Arepo/Cluster Knowledge Sharing" meeting at AIP, 2018-2019
- Local organiser of the 3rd ICM Theory and Computation Workshop, August 11-14, 2014

Programming skills and software

Languages: Python, C, C++, Fortran, Matlab and Mathematica.
Codes: AREPO (co-developer), ATHENA (self-modified local version) and ATHENA++ (user).
My own software: PAICOS (GPU-enabled simulation analysis and visualization), PSECAS (linear theory with pseudo-spectral methods), SKELETOR (a 2D hybrid-kinetic particle-in-cell code), PLASMA-DISPERSION (solver for gyrotropic distribution functions), COMOVING_MHD_WAVES (reference solutions for comoving MHD waves).

Selected talks

- Making waves and instabilities, **University of Oxford** — Jul 29, 2024
- 7th ICM Theory and Computation Workshop, **Ann Arbor**, Michigan — Jun 25, 2024
- Galaxy Seminar Friday, **Center for Computational Astrophysics**, NY — Jun 21, 2024
- Kavli Institute for Astrophysics & Space Research, **MIT** — Jun 19, 2024
- Galaxy Cluster meeting, **CfA, Harvard** — Jun 18, 2024
- Astrophysics Seminars, **DAMTP**, University of Cambridge — May 28, 2024
- Annual Danish National Astronomy Meeting, Denmark — May 23, 2024
- MIST 2023, Cosmic Turbulence and Magnetic Fields, **Cargèse**, France — Sep 29, 2023
- 6th ICM Theory and Computation Workshop, **NBI**, Copenhagen — Aug 19, 2022
- Virgo meeting talk II, **Max Planck Institute for Astrophysics** — Jul 12, 2022
- Virgo meeting talk I, **Max Planck Institute for Astrophysics** — Jul 11, 2022
- Seminar talk, **Max Planck Institute for Astrophysics** — Jan 17, 2020
- Santa Barbara Astro Lunch, **UCSB** — Sep 25, 2019
- Multiscale Phenomena in Plasma Astrophysics, **KITP** — Sep 9, 2019
- Physics of the Intra-Cluster Medium: Theory and Computation, Budapest — Mar 5, 2019
- ICM Physics and Modeling, **MPA/ESO**, Garching — Oct 10th, 2018
- AIP Colloquium, AIP, Potsdam — Jul 26, 2018
- PhD Prize talk, Annual Danish National Astronomy Meeting, Denmark — May 3, 2018
- Astrophysics Seminars, **DAMTP**, University of Cambridge — Nov 14, 2016
- GAFD Seminars, University of California, **Santa Cruz** — Sep 27, 2016
- Theoretical Astrophysics Center, University of California, **Berkeley** — Aug 17, 2016
- Astrophysics Seminars, University of California, **Santa Barbara** — Jun 3, 2015
- Workshop on turbulence, **Les Houches** — Mar 25, 2015
- 3rd ICM Theory and Computation Workshop, **NBI**, Copenhagen — Aug 12, 2014
- Annual Danish National Astronomy Meeting, Denmark — Jun 17, 2014

Supervision

Leibniz-Institut für Astrophysik Potsdam (AIP)

- Advisor for the MSc project of Oliver Franke — April 2019 – September 2020
- Advisor for the MSc project of Larissa Tevlin — April 2022 – June 2023
- Advisor for the MSc project of Jonas Ølshøj Pedersen — Nov 2023 – Sep 2024
- Advisor for the BSc project of Pierre Labadens — Feb 2024 – Jun 2024

Teaching

Guest lectures

- 2 h lecture on *MHD, Galaxy Clusters and Kelvin-Helmholtz Instability* at NBI — Oct 24, 2023
- 2 h lecture on *Magnetohydrodynamic Waves And Instabilities* at NBI — Oct 4, 2023
- 2 h lecture on *Basics of Magnetohydrodynamics* at NBI — Oct 3, 2023
- 1.5 h lecture on galaxy formation at the University of Potsdam — Jun 6, 2023
- 1 hour introduction to MHD instabilities at AIP — Jun 24, 2020
- 25 min lecture in the Theoretical Astrophysics course at NBI — Oct 23, 2017

Teaching assistant at the Niels Bohr Institute, University of Copenhagen

- Mathematics for physicists II — Spring 2010 & 2011
- Electromagnetism and electronics — Spring 2011
- Electromagnetism II — Fall 2013
- Thermodynamics — Spring 2013
- Theoretical Astrophysics — Fall 2015
- Geophysical Fluid Dynamics — Fall 2015

Utrecht University, the Netherlands Sep 2012 – Dec 2012
- Co-supervised a project on Bose-Einstein condensates

Frederiksberg Gymnasium, Copenhagen Aug 2011 – Dec 2011
- Taught physics and natural sciences at the upper secondary level

Grants

- Leon Rosenfeld Scholarship Fund (10.000 DKK) 2024
- Marie Skłodowska-Curie Individual Fellowship (230,000 €) 2023
- 17 mio. cpu-hours at SuperMUC-NG at LRZ (PI, equivalent to 1.5 mio. DKK) 2023
- 11 mio. cpu-hours at SuperMUC-NG at LRZ (PI, equivalent to 1 mio. DKK) 2020
- Oticon 10.000 DKK 2016
- Lørup Scholar Stipend 50.000 DKK 2014
- Julie Damms Studiefond, Oticon & Erasmus (three grants totaling 25.000 DKK) 2012

Professional and Academic Service

Referee for the Astrophysical Journal, Monthly Notices of the Royal Astronomical Society (MNRAS), the European Physical Journal Plus (EPJP), and Astronomy and Astrophysics (A&A).

First author publications

1. *Paicos: A Python package for analysis of (cosmological) simulations performed with Arepo*
   Thomas Berlok, Léna Jlassi, Ewald Puchwein, Troels Haugbølle
   The Journal of Open Source Software, 9, 6296 (2024)

2. *Hydromagnetic waves in an expanding universe – cosmological MHD code tests using analytic solutions*
   Thomas Berlok
   Monthly Notices of the Royal Astronomical Society, 515, 3492 (2022)

3. *Suppressed heat conductivity in the intracluster medium: implications for the magneto-thermal instability*
   Thomas Berlok, Eliot Quataert, Martin E. Pessah, Christoph Pfrommer
   Monthly Notices of the Royal Astronomical Society, 504, 3435 (2021)

4. *Braginskii viscosity on an unstructured, moving mesh accelerated with super-time-stepping*
   Thomas Berlok, Ruediger Pakmor, Christoph Pfrommer
   Monthly Notices of the Royal Astronomical Society, 491, 2919 (2020)

5. *The impact of magnetic fields on cold streams feeding galaxies*
   Thomas Berlok, Christoph Pfrommer
   Monthly Notices of the Royal Astronomical Society, 489, 3368 (2019)

6. *On the Kelvin-Helmholtz instability with smooth initial conditions – Linear theory and simulations*
   Thomas Berlok, Christoph Pfrommer
   Monthly Notices of the Royal Astronomical Society, 485, 908 (2019)

7. *On Helium Mixing in Quasi-global Simulations of the Intracluster Medium*
   Thomas Berlok, Martin E. Pessah
   The Astrophysical Journal, 833, 164 (2016)

8. *Local Simulations of Instabilities Driven by Composition Gradients in the ICM*
   Thomas Berlok, Martin E. Pessah
   The Astrophysical Journal, 824, 32 (2016)

9. *Plasma Instabilities in the Context of Current Helium Sedimentation Models: Dynamical Implications for the ICM in Galaxy Clusters*
   Thomas Berlok, Martin E. Pessah
   The Astrophysical Journal, 813, 22 (2015)