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: 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

- (Scheduled) 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 –
- Advisor for the BSc project of Pierre Labadens — Feb 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 and MNRAS.

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)