# Curriculum Vitae

## Personal Data


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| Full Name | Christian Ecker |
| Current Affiliation | Institute for Theoretical Physics, Goethe University Frankfurt, Max-von-Laue-Str. 1, 60438 Frankfurt am Main, Germany |
| Email | ecker@itp.uni-frankfurt.de |
| ORCID | 0000-0002-8669-4300 |
| Publications | inspirehep.net/authors/1657736 |


## Education

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| Apr 2014 – Sep 2018 | **TU-Wien**<br>PhD in Theoretical High Energy Physics, 7 Sep 2018<br>PhD Thesis: "Entanglement Entropy from Numerical Holography"<br>Supervisor: Prof. Daniel Grumiller |
| Oct 2005 – Jun 2013 | **TU-Wien**<br>MSc in Theoretical Solid State Physics, 24 June 2013<br>Master Thesis: "Continuous-Time Quantum Monte Carlo"<br>Supervisor: Prof. Karsten Held |
| Sep 2000 – Jul 2004 | **HTL Ottakring**, Vienna<br>Secondary College of Mechanical Engineering |

## Employment

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| since Jul 2020 | **Goethe University Frankfurt am Main**<br>Institute for Theoretical Physics, Postdoc |
| since Jan 2026 | Project Leader in Trans-Regional Collaborative Research Cluster for Strong-interaction matter (CRC-TR 211) (https://crc-tr211.org/) |
| Feb 2021 – Dec 2025 | Postdoctoral Researcher in CRC-TR 211 |
| Oct 2018 – Jun 2020 | **Utrecht University**<br>Institute for Theoretical Physics, Postdoc<br>Delta Institute for Theoretical Physics (https://www.d-itp.nl/) |
| Apr 2014 – Sep 2018 | **TU-Wien**<br>Institute for Theoretical Physics, Project Assistant (PhD student)<br>Doctoral College for Particles and Interactions (http://www.dkpi.at/) |
| Mar 2005 – Apr 2014<br>(part-time, 20h/week) | **Siemens AG Austria**, Vienna<br>Engineering Department, Finite Element Analysis of Railway Vehicles |
| Aug 2004 – Feb 2005 | **Military Service**, Klosterneuburg, Austria |

## Research Visits

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| Apr 2017 – Jul 2017 | **University of Barcelona** (Host: Prof. David Mateos)<br>Non-Conformal Plasma Formation, Numerical Holography |
| Sep 2016 – Dec 2016 | **University of Helsinki** (Host: Prof. Aleksi Vuorinen)<br>Applications of Holography to Neutron Star Physics |

## Teaching

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| Apr 2025–Jul 2025 | ***Advanced General Relativity*** (3h/week lecture + tutorials), Goethe University |
| Oct 2024–Feb 2025 | ***Introduction to General Relativity*** (3h/week lecture + tutorials), Goethe University |
| Apr 2024–Jul 2024 | Teaching assistant of the course ***Theoretical Physics II*** by Prof. Laura Sagunski, Goethe University |

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| Oct 2021–Feb 2022 | Teaching assistant of the course ***Hydrodynamics and Magnetohydrodynamics*** by Dr. Alejanro Cruz-Osorio, Goethe University |
| Apr 2021–Jul 2021 | Teaching assistant of the course ***Introduction to Astronomy*** by Prof. Jürgen Schaffner-Bielich, Goethe University |
| Oct 2020–Feb 2021 | Teaching assistant of the course ***Introduction to General Relativity*** by Prof. Luciano Rezzolla, Goethe University |
| Sep 2019 | Invited lecture series on ***Numerical Holography***, DKPI Summer School, Zwettl, Austria |
| Apr 2019 | Invited lecture on ***Numerical Holography***, TIFR ICTS School, Bengalore, India |

## Supervising Activities

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| since Nov 2024 | Felix Ahlbrecht, Master Student, Goethe University<br>**Master Thesis:** *Constraining Relativistic Mean Field Models with Astrophysics Data* |
| since May 2024 | Sinan Altiparmak, Master Student, Goethe University<br>**Master Thesis:** *Temperature extension of Generic Equation of State Models* |
| Aug 2022 – Dec 2023 | Alina Stehr, Master Student, Goethe University (main supervisor: Prof. L. Rezzolla)<br>**Master Thesis:** *Impact of quark matter formation on the prompt collapse of binary neutron star mergers* |
| Jan 2021 – Apr 2022 | Sinan Altiparmak, Bachelor Student, Goethe University (Prof. L. Rezzolla)<br>**Bachelor Thesis:** *On the Speed of Sound in Neutron Stars* |
| Mar 2020 – Jun 2020 | Jonah Post, Bachelor Student, Leiden University (Prof. K. Schalm)<br>**Bachelor Thesis:** *Lax Entropy Conditions for the One-Dimensional Riemann Problem* |
| Oct 2018 – Jun 2020 | Govert Nijs, Graduate Student, Utrecht University (Prof. U. Gürsoy)<br>**PhD Thesis:** *Holography in Quark-Gluon Plasma and Neutron Stars* |
| | Philipp Stanzer, Graduate Student, TU-Wien (Prof. D. Grumiller) |
| Apr 2016 – Sep 2020 | **PhD Thesis:** *Numerical Relativity, Holography and the Quantum Null Energy Condition* |
| Apr 2015 – Mar 2016 | **Master Thesis:** *Entanglement Entropy in Heavy Ion Collisions* |
| | Ognen Kapetanoski, Master Student, TU-Wien (Prof. D. Grumiller) |
| Apr 2015 – Jun 2016 | **Master Thesis:** *Entanglement Entropy in 2D-Dilaton Gravity* |

## Organisation and Administration

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| 2023 – 2024 | Organizer of the Astrocoffee seminar series at Goethe University and the Frankfurt Institute for Advanced Studies |
| since 2021 | Project administrator and contributor of the project *Microphysical aspects of binary neutron star mergers* (300+ Mio. core-h) at the High-Performance Computing Center Stuttgart |
| 2021 – 2022 | Jounal Club of the Relativistic Astrophysics Group Frankfurt |
| Sep 2019 – Jun 2020 | Utrecht String Theory Seminar |

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| Mar 2015 – Jan 2016 | Vienna Theory Lunch Seminar |
| Apr 2014 – Oct 2018 | Debian Network Administration at ITP TU-Wien |

## Scientific Refereeing

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| since 2023 | Referee for high-performance computing applications at the Gauss Center for Supercomputing (GCS) and the John von Neumann Institute for Computing (NIC) |
| since 2022 | Referee for American Physical Society: Physical Review D (PRD), Physical Review Letter (PRL)<br>American Astronomical Society: The Astrophysical Journal (ApJ)<br>Springer: Journal of High Energy Physics (JHEP)<br>Elsevier: Nuclear Physics A (NPA) |

## Academic Distinctions

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| Jun 2024 | Frankfurt Physics Science Award (5.000 euros) |
| since 2022 | Full member of the Collaborative Research Cluster CRC-TR 211, group leader in the expected 3rd funding period (2026 – 2030) |
| since 2021 | Associate member of the The Hessian Research Cluster ELEMENTS |
| Dec 2020 | Main Campus Educator Fellowship (9.600 euros) |
| Feb 2020 | Marie Skłodowska-Curie Individual Fellowship, H2020-MSCA-IF-2019 (225.933,76 euros, declined) |
| Apr 2014 | Selected PhD student in the graduate program Particles and Interactions at TU-Wien |

## Outreach

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| 14 Apr 2025 | Introduction to theoretical astrophysics at ITP for first semester students, Goethe University Frankfurt, Germany |
| 28 Jun 2023 | Training for high school teachers: Gravitational wave astronomy, Physikzentrum Bad Honnef, Germany<br>*Neutron stars as laboratory for dense nuclear matter* |
| 15 Nov 2022 | Press release, featured, e.g., in Frankfurter Allgemine Zeitung<br>*Cosmic chocolate pralines: general neutron star structure revealed* |
| 1 Nov 2022 | Press release<br>*As dense as it gets: New Model for Matter in Neutron Star Collisions* |
| 6 Oct 2022 | Talk at the 20th Day of Science (Goethe University Frankfurt)<br>*Neutronensterne als Labor für Dichte Materie* |
| 21 Jun 2022 | Interdisciplinary Colloquium of the Polytechnical Society Frankfurt<br>*Neutronensterne als Labor für Dichte Materie* |

## Selected Talks

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|---|---|
| 15 May 2025 | *Probing the Phase Diagram and Equation of State of QCD in Neutron Star Mergers: From Prompt Collapse to Long Ringdown Signals*, Astrophysics Seminar, Southampton University, England |
| 8 Apr 2025 | *Listening to the long ringdown: a novel way to pinpoint the EOS in neutron-star cores*, Quark Matter 2025, Goethe University Frankfurt, Germany |
| 1 Apr 2025 | *Listening to the long ringdown: a novel way to pinpoint the EOS in neutron-star cores*, DPG Spring meeting 2025, Göttingen, Germany |

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| 9 Oct 2024 | *Probing the Phase Diagram and Equation of State of QCD in Neutron Star Mergers: From Prompt Collapse to Long Ringdown Signals*,<br>Max-Planck-Institut für Gravitationsphysik, AEI, Potsdam, Germany |
| 12 Jun 2024 | *Binary neutron star mergers in the prompt and non-prompt collapse regime*,<br>Holography and dense matter workshop, APC, Paris, France |
| 14 Mar 2024 | *Exploring Neutron Star Mergers in the Prompt and Non-Prompt Collapse Regime*,<br>DPG Spring meeting 2024, Gießen, Germany |
| 13 Sep 2023 | *A dynamical inflaton coupled to strongly interacting matter*,<br>TH Cosmo Coffee, CERN, Switzerland |
| 30 May 2023 | *A dynamical inflaton coupled to strongly interacting matter*,<br>Theory Palaver, Johannes Gutenberg University Mainz, Germany |
| 25 May 2023 | *A dynamical inflaton coupled to strongly interacting matter*,<br>Theory Seminar, TU-Wien, Austria |
| 19 Jan 2023 | *Exploring the Phase Diagram of V-QCD with Neutron Star Merger Simulations*,<br>String theory seminar, Utrecht University, Netherlands |
| 8 Nov 2022 | *On the Sound Speed in Neutron Stars*,<br>QCD and gauge/gravity duality, APCTP focus program, Phang University, Korea |
| 25 Oct 2022 | *On the Sound Speed in Neutron Stars*,<br>From Holography to Machine Learning, Helsinki Institute of Physics, Finland |
| 1 Aug 2022 | *Exploring the Phase Diagram of V-QCD with Neutron Star Mergers*,<br>15th Quark Confinement Conference, University Stavanger, Norway |
| 4 May 2022 | *On the Sound Speed in Neutron Stars*,<br>ELEMENTS annual conference, Goethe University Frankfurt, Germany |
| 22 Jun 2021 | *Non-equilibrium steady state formation in 3+1 dimensions*,<br>Theory Seminar, University Würzburg, Germany |
| 14 Jul 2020 | *Compact stars made of holographic QCD matter*,<br>Theory Seminar, Southampton University, England |
| 25 Oct 2019 | *Gravitational Waves from Holographic Neutron Star Mergers*,<br>Holography: triangle meeting, Amsterdam University, Netherlands |
| 8 Oct 2019 | *Gravitational Waves from Holographic Neutron Star Mergers*,<br>Heavy Ion Coffee, CERN, Switzerland |