

Kevin Schoeffler
IPFN, Instituto Superior Técnico, Lisbon, Portugal
kschoeffler@ipfn.ist.utl.pt

Education

University of Maryland	Physics	Ph.D. 2012
University of Maryland	Physics	B.S. 2005
University of Maryland	Mechanical Engineering	B.S. 2005

Appointments

Researcher (Luis Silva)	Instituto Superior Técnico	April 2019 – Present
Postdoctoral Researcher (Luis Silva)	Instituto Superior Técnico	July 2014 – Present
Postdoctoral Researcher (Nuno Loureiro)	Instituto Superior Técnico	July 2012 – July 2014
Graduate Research Assistant (James Drake)	University of Maryland	Sept 2006 – June 2012
Research Assistant (James Drake)	University of Maryland	Sept. 2005 – Sept 2006
Undergraduate Research Assistant (James Drake)	University of Maryland	June 2005 – Sept. 2005
Undergraduate Research Assistant (William Dorland)	University of Maryland	May 2003 – Sept. 2004

Research interests

I have focused my studies on the kinetic effects on the dynamics of magnetic field generation by processes such as the Biermann battery and the Weibel instability, and of the release of magnetic energy via magnetic reconnection. Recently, I have begun investigating the relevance of these processes in extreme environments like magnetars and pulsar magnetospheres, where quantum electrodynamic (QED) effects play an important role, pair plasmas are generated, and the role of magnetic reconnection remains an important unanswered question.

Publications

- “Magnetized current filaments as a source of circularly polarized light” U. Sinha, K. M. Schoeffler, J. Martins, J. Vieira, R.A. Fonseca, and L. O. Silva. *J. Plasma Phys.*, 87, 1, doi:10.1017/S0022377821000040, 2021
- “High-order harmonic generation in an electron-positron-ion plasma” W. L. Zhang, T. Grismayer, K. M. Schoeffler, R. A. Fonseca, and L. O. Silva. *Phys. Rev. E*, 103, 013206, doi:10.1103/PhysRevE.103.013206, 2021
- “Effects of collisions on the generation and suppression of temperature anisotropies and the Weibel instability” K. M. Schoeffler and L. O. Silva. *Phys. Rev. R*, 2, 033233, doi:10.1103/PhysRevResearch.2.033233, 2020
- “Interplay between the Weibel instability and the Biermann battery in realistic laser-solid interactions” N. Shukla, K. M. Schoeffler, E. Boella, J. Vieira, R. A. Fonseca, and L. O. Silva. *Phys. Rev. R*, 2, 023129, doi:10.1103/PhysRevResearch.2.023129, 2020
- “Anisotropic heating and magnetic field generation due to Raman scattering in laser-plasma interactions” T. Silva, K. M. Schoeffler, J. Vieira, M. Hoshino, R. A. Fonseca, and L. O. Silva *Phys. Rev. R*, 2, 023080, doi:10.1103/PhysRevResearch.2.023080, 2020
- “Bright Gamma-Ray Flares Powered by Magnetic Reconnection in QED-strength Magnetic Fields” K. M. Schoeffler, T. Grismayer, D. Uzdensky, R. Fonseca, and L. O. Silva, *Ap. J.*, 870, 1, doi:10.3847/1538-4357/aaf1b9, 2019
- “The fully kinetic Biermann battery and associated generation of pressure anisotropy” K. M. Schoeffler, N. F. Loureiro, and L. O. Silva, *Phys. Rev. E*, 97, 033204, doi:PhysRevE.97.033204, 2018
- “General kinetic solution for the Biermann battery with an associated pressure anisotropy generation” K. M. Schoeffler and L. O. Silva, *Plasma Phys. Control. Fusion*, 60, p.014048, doi:10.1088/1361-6587/aa883a, 2018

- “Magnetic turbulence in a table-top laser-plasma relevant to astrophysical scenarios” G. Chatterjee, K. M. Schoeffler, P. K. Singh, A. Adak, A. D. Lad, S. Sengupta, P. Kaw, L. O. Silva, A. Das, and G. R. Kumar, *Nat. Commun.*, 15970, doi:10.1038/ncomms15970, 2017
- “The generation of magnetic fields by the Biermann battery and the interplay with the Weibel instability” K. M. Schoeffler, N. F. Loureiro, R. A. Fonseca, and L. O. Silva, *Phys. Plasmas*, 23, doi:10.1063/1.4946017, 2016
- “Magnetic field generation and amplification in an expanding plasma” K. M. Schoeffler, N. F. Loureiro, R. A. Fonseca, and L. O. Silva, *Phys. Rev. Lett.*, 112, doi:10.1103/PhysRevLett.112.175001, 2014
- “The role of temperature anisotropies in limiting electron acceleration during magnetic reconnection,” K. M. Schoeffler, J. F. Drake, M. Swisdak, and K. Knizhnik, *Ap. J.*, 764, doi:10.1088/0004-637X/764/2/126, 2013
- “Scaling of the growth rate of magnetic islands in the heliosheath,” K. M. Schoeffler, J. F. Drake, and M. Swisdak, *Ap. J. Lett.*, 750, doi:10.1088/2041-8205/750/2/L30, 2012
- “The effects of plasma beta and anisotropy instabilities on the dynamics of reconnecting magnetic fields in the heliosheath,” K. M. Schoeffler, J. F. Drake, and M. Swisdak, *Ap. J.*, 743, doi:10.1088/0004-637X/743/1/70, 2011
- “Is the magnetic field in the heliosheath laminar or a turbulent sea of bubbles?,” M. Opher, J. F. Drake, M. Swisdak, K. M. Schoeffler, J. D. Richardson, R. B. Decker, and G. Toth, *Ap. J.*, 743, doi:10.1088/0004-637X/734/1/71, 2011
- “Formation of secondary islands during magnetic reconnection,” J. F. Drake, M. Swisdak, K. M. Schoeffler, B. N. Rogers, and S. Kobayashi, *J. Geophys. Res.*, 33, doi:10.1029/2006GL025957, 2006

Invited Talks

- “Triggering QED processes by reconnection in near critical magnetic fields” Dartmouth plasma seminar, Dartmouth NH, 18 September 2019
- “Biermann vs. Weibel: General kinetic solution for the generation of magnetic fields via density and temperature gradients” 5th LaB meeting on Magnetic Fields in Laboratory High Energy Density Plasmas, Moscow-St. Petersburg, Russia, 27 July 2017
- “Kinetic solution for the generation of magnetic fields via the Biermann battery” 44th European Physical Society Conference on Plasma Physics Belfast, Northern Ireland, 29 June 2017
- “Modeling dark matter interactions with counter-streaming electron-positron plasmas” KIPAC Tea talk, Stanford CA, 24 May 2016
- “Kinetic effects in non-collisional temperature and density gradients and the Biermann battery” DAMTP Seminar, University of Cambridge, 29 February 2016
- “The generation of Biermann battery fields in laser-plasma interactions and the interplay with the Weibel instability ” 57th APS Annual Meeting of the Division of Plasma Physics, Savannah GA, 18 November 2015
- “A kinetic model for the Biermann battery and the interplay with the Weibel instability” 4th LaB meeting on Magnetic Fields in Laboratory High Energy Density Plasmas, Princeton NJ, 11 November 2015
- “Magnetic field generation and amplification in an expanding plasma” 7th Plasma Kinetics Working Group Meeting, Wolfgang Pauli Institute, 5 April 2014
- “Reconnection in the heliosheath: Effects of plasma beta on particle acceleration and the shape of magnetic islands” Harvard Smithsonian CFA, 3 October 2011
- “Acceleration of ions and electrons in multiple current sheets and the interplay between anisotropy and beta” SHINE 2010, 26 July 2010
- “PUIs ENAs and ACRs a trio of acronyms” Student Day Introduction SHINE 2010, 25 July 2010

Graduate and Undergraduate Advisors

Graduate Advisor	James Drake
Undergraduate Advisor	William Dorland

University of Maryland
University of Maryland

Memberships

- American Physical Society
- American Geophysical Union