

Curriculum Vitae: Marius Eichler

Marius Eichler
Technische Universität Darmstadt
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Date of birth: 13/03/1987
Place of birth: Basel (CH)
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Education

- 02/2012 - 03/2016 **PhD in Theoretical Physics**, University of Basel,
Research Group F.-K. Thielemann
- 09/2009 - 01/2012 **Masters Degree in Physics**, University of Basel,
Research Group F.-K. Thielemann
- 10/2006 - 07/2009 **Bachelors Degree in Physics**, University of Basel
- 08/2002 - 12/2005 **Matura (high school) certificate**, Gymnasium Oberwil

Research Experience

- since 04/2016 **Postdoctoral position**, TU Darmstadt,
Research group of Prof. A. Arcones
- 04/2017 - 10/2018 **SNSF Early Postdoc.Mobility fellow**, TU Darmstadt,
Project title: “R-Process Nucleosynthesis and Electromagnetic
Transients in Dynamic Ejecta of Neutron Star Mergers”
- 02/2012 - 03/2016 **PhD thesis**, University of Basel,
Thesis title: “Nucleosynthesis in Explosive Environments:
Neutron Star Mergers and Core-Collapse Supernovae”,
Thesis advisors: Prof. F.-K. Thielemann, Prof. S. Rosswog
- 08/2011 - 01/2012 **Master thesis**, University of Basel,
Thesis title: “Parametric Studies of the r-Process in the Supernova
Shock”,
Thesis advisors: Prof. F.-K. Thielemann, Dr. A. Arcones

Awards and Grants

- 04/2017 - 10/2018 **SNSF Early Postdoc.Mobility Fellowship**
CHF 69750 (\approx EUR 61200)

Teaching and Mentoring Activities

TU Darmstadt:

- 06/2018 - 08/2018 **Teaching assistant,**
“Computational Physics”
- 10/2016 - 02/2017 **Supervisor for student seminar,**
“Astrophysics”
- 06/2016 - 08/2016 **Teaching assistant,**
“Computational Physics”

University of Basel:

- 02/2015 - 06/2015 **Teaching assistant,**
“Nukleare Astrophysik II”
- 09/2014 - 12/2014 **Teaching assistant,**
“Nukleare Astrophysik I”
- 02/2014 - 06/2014 **Teaching assistant,**
“Symmetrien, Teilchen und Felder”
- 09/2013 - 12/2013 **Teaching assistant,**
“Mathematische Methoden der Teilchenphysik”
- 02/2013 - 06/2013 **Teaching assistant,**
“Thermodynamik und Statistische Mechanik”
- 09/2012 - 12/2012 **Teaching assistant,**
“Astrophysical Explosions in Binary Stellar Systems”
- 02/2012 - 06/2012 **Teaching assistant,**
“Thermodynamik und Statistische Mechanik”
- 02/2011 - 07/2011 **(Undergraduate) Teaching assistant,**
“Mathematische Methoden II”
- 02/2010 - 01/2011 **(Undergraduate) Teaching assistant,**
“Physikalisches Praktikum”
- 09/2009 - 01/2010 **(Undergraduate) Teaching assistant,**
“Einführung in die Physik I”

Master Students:

- 01/2018-01/2019 Wida Sayar
“Astrophysical conditions of the actinide boost phenomenon”
- 04/2016-12/2016 Moritz Reichert
“Reduced nuclear reaction network for hydrodynamical simulations”

PhD Students:

- since 12/2016 Moritz Reichert
“Nucleosynthesis of supernovae and neutron star mergers”

Selected Publications

M. Eichler, W. Sayar, A. Arcones, and T. Rauscher,
“Probing the Production of Actinides Under Different Conditions”,
submitted to the Astrophysical Journal.

B. Côté, **M. Eichler**, A. Arcones, et al.,
“Current Tensions with Neutron Star Mergers and the Evolution of r-Process Elements in the Milky Way”,
The Astrophysical Journal, in press.

B. Giacomazzo, **M. Eichler**, and A. Arcones,
“Electromagnetic Emission and Nucleosynthesis from Neutron Star Binary Mergers”,
The Physics and Astrophysics of Neutron Stars, Springer International Publishing AG,
ed. L. Rezzolla, P. Pizzochero, D. I. Jones, N. Rea, and I. Vidaña, p. 637 (2018).

M. Eichler, K. Nakamura, T. Takiwaki, et al.,
“Nucleosynthesis in 2D Core-Collapse Supernovae of 11.2 and 17.0 M_{\odot} Progenitors: Implications for Mo and Ru Production”,
Journal of Physics G: Nuclear and Particle Physics **45**, 1 (2018).

F.-K. Thielemann, **M. Eichler**, I. V. Panov, and B. Wehmeyer,
“Neutron Star Mergers and Nucleosynthesis of Heavy Elements”,
Annual Review of Nuclear and Particle Science **67**, 253 (2017).

I.V. Panov, Yu. S. Lutostansky, **M. Eichler**, and F.-K. Thielemann,
“Determination of the Galaxy age by the method of uranium-thorium-plutonium isotopic ratios”,
Physics of Atomic Nuclei **80**, 657 (2017).

F.-K. Thielemann, **M. Eichler**, I. V. Panov, et al.,
“Making the Heaviest Elements also in a Rare Class of Supernovae?”,
Handbook of Supernovae, Springer International Publishing AG, ed. Athem W. Alsabti and Paul Murdin, p. 1843 (2017).

M. Eichler, A. Arcones, A. Kelic, et al.,
“The Role of Fission in Neutron Star Mergers and its Impact on the r-Process Peaks”,
The Astrophysical Journal **808**, 30 (2015).

A. Perego, M. Hempel, C. Fröhlich, K. Ebinger, **M. Eichler**, et al.,
“PUSHing Core-Collapse Supernovae to Explosions in Spherical Symmetry. I. The Model and the Case of SN 1987A”,
The Astrophysical Journal **806**, 275 (2015).

Scientific Posters

- 06/2018 “*Nuclear Energy Generation in the r-Process*”
Nuclei in the Cosmos XV, Assergi (IT)
- 06/2016 “*Nucleosynthesis in 2D Core-Collapse Supernova Simulations of 11.2 and 17.0 M_{\odot} Progenitors*”
Nuclei in the Cosmos XIV, Niigata (JP)
- 05/2015 “*Explosive Nucleosynthesis in Core-Collapse Supernovae: The Titanium Problem*”
Nuclear Physics in Astrophysics VII, York (UK)
- 03/2013 “*Nucleosynthesis Calculations in Explosive Environments*”
Student Science Fair, Basel (CH)
- 08/2012 “*Parametric Studies of the R-Process in Supernova Shocks*”
Nuclei in the Cosmos XII, Cairns (AU)
- 06/2012 “*The r-Process*”
Swiss Physical Society Annual Meeting, Zürich (CH)

Presentations and Seminars

- 04/2019 “*What do actinide-boost stars reveal about the r-process?*”,
Seminar, Konkoly Observatory, Budapest (HU)
- 02/2019 “*The r-process: a review*”,
Invited talk, ChETEC Working Group 3 Workshop, Vilnius (LT)
- 11/2018 “*Theoretical r-process sites and their signatures*”
Talk, Chemical Evolution and Nucleosynthesis Across the Galaxy, Heidelberg (DE)
- 07/2018 “*Theoretical r-process sites and their signatures*”,
Talk, Topical Program: FRIB and the GW170817 kilonova, East Lansing MI (USA)
- 07/2018 “*Theoretical r-process sites and their signatures*”,
Invited talk, The Metal-poor Galaxy, Ringberg (DE)
- 03/2018 “*The (Hot) R-Process Scenario: From Reaction Equilibria to Kilonovae*”,
Invited talk, Russbach school of nuclear astrophysics, Russbach (AT)
- 11/2017 “*The (Hot) R-Process Scenario: From Reaction Equilibria to Kilonovae*”,
Invited talk, Physics Cases and Instrumentation for EURISOL-DF, the next step towards EURISOL, Lisbon (PT)
- 08/2017 “*Nuclear physics effects in post-merger evolution*”,
Talk, INT Program INT-17-2b: Electromagnetic Signatures of r-process Nucleosynthesis in Neutron Star Binary Mergers, Seattle WA (USA)
- 08/2017 “*Late-time heating rate sensitivities on nuclear mass models*”
Talk, INT Program INT-17-2b: Electromagnetic Signatures of r-process Nucleosynthesis in Neutron Star Binary Mergers, Seattle WA (USA)

Presentations and Seminars (continued)

- 06/2017 “*Nucleosynthesis of Heavy Elements: Open Questions*”,
Invited talk, JINA-CEE workshop: “Forging Connections: From Nuclei to the Cosmic Web”, East Lansing MI (USA)
- 06/2017 “*On the production of heavy elements in our universe: the third r-process peak and the p-nuclei $^{92,94}\text{Mo}$ and $^{96,98}\text{Ru}$* ”,
Seminar, Nuclear Physics Seminar, York (UK)
- 03/2017 “*Explosive Nucleosynthesis in 2D Core-Collapse Supernovae and the Origin of the p-Nuclei $^{92,94}\text{Mo}$ and $^{96,98}\text{Ru}$* ”,
Talk, Frühjahrstagung der Deutschen Physikalischen Gesellschaft, Münster (DE)
- 01/2017 “*The Role of Fission in Neutron Star Mergers and its Impact on the r-Process Peaks*”,
Talk, International Workshop XLV “Neutron star mergers: From gravitational waves to nucleosynthesis”, Hirschegg (AT)
- 12/2016 “*The Third r-Process Peak and the Origin of the p-Nuclei $^{92,94}\text{Mo}$ and $^{96,98}\text{Ru}$* ”,
Seminar, Los Alamos Astro Seminar, Los Alamos NM (USA)
- 06/2016 “*Nucleosynthesis in 2D Core-Collapse Supernova Simulations of 11.2 and 17.0 M_{\odot} Progenitors*”,
Talk, 2nd NAOJ-ECT* Workshop “Many Riddles About Core-Collapse Supernovae: 1 Bethe and Beyond”, Tokyo (JP)
- 07/2015 “*The Role of Fission in Neutron Star Mergers and its Impact on the r-Process Peaks*”,
Invited talk, CETUP* Workshop “Nuclear and neutrino physics inputs for astrophysical simulations of the formation of heavy elements”, Lead SD (USA)
- 05/2015 “*The Role of Fission in Neutron Star Mergers and its Impact on the r-Process Peaks*”,
Talk, Nuclear Physics in Astrophysics VII Satellite Meeting “Nuclear physics and r-process nucleosynthesis”, Edinburgh (UK)
- 09/2014 “*Fission in r-Process Calculations and the Position of the Third Peak*”,
Talk, ECT* Workshop “Nuclear Physics and Astrophysics of Neutron-Star Mergers and Supernovae, and the Origin of R-Process Elements”, Trento (IT)
- 07/2014 “*The Influence of Fission on Neutron Star Merger r-Process and the Position of the Third r-Process Peak*”,
Talk, Nuclei in the Cosmos XIII, Debrecen (HU)
- 12/2013 “*Fission in Neutron Star Mergers and the Position of the Third Peak*”,
Invited talk, NAVI Annual Meeting 2013, Darmstadt (DE)
- 05/2013 “*The Impact of Fission on r-Process Calculations*”,
Talk, Nuclear Physics in Astrophysics VI, Lisbon (PT)

Services to the Scientific Community

since 2019	Scientific referee for Monthly Notices of the Royal Astronomical Society
since 2018	Scientific referee for The Astrophysical Journal
05/2018	Outreach talk: “Die Entstehung der schweren Elemente im Universum”, Vernetzungstreffen des Deutschen Jungforschernetzwerks juFORUM e.V.

Additional Experience and Personal Initiative

since 11/2016	Member of Sonderforschungsbereich 1245
09/2013 - 03/2016	PhD - Students Representative at the Department of Physics, University of Basel
08/2012	Co - Founder of company sports football team FC NL Tuning II (FVNWS Serie B)
09/2008 - 05/2010	PR Manager for the University of Basel Orchestra
03/2006 - 08/2006	Military service as a Musician in the Rekrutenspiel RS 16-1 (concertmaster)
since 08/1995	Classical clarinet practice and participation in various amateur orchestras

Languages

German:	Native Language
English:	Fluent in writing and speech
French:	Conversant in writing and speech
Ancient Greek:	Basic Knowledge
Latin:	Basic Knowledge