

Curriculum Vitae

Dr. Michael Lupberger

Personal data

Date of birth 24/06/1983
Place of birth Freiburg im Breisgau, Germany
Marital status Married, two children (born December 2016 and February 2020)
Nationality German
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Summary

- Physicist | Field: Experimental particle/nuclear physics | Core research: Detectors & data acquisition
 - Currently: Postdoctoral researcher and BMBF co-project leader
 - Previously: EU Marie Curie Fellow (2020-2022) and CERN Fellow (2016-2019)
 - PhD defence 08/03/2016, University of Bonn
 - Third-party funds: 175 k€ + 2 M€ (my projects with other PIs), Internal funds: ≈ 45 k€
 - 52 publications (4 in *large* collaborations, 11 first or corresponding author, INSPIRE HEP h-index: 10)
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References: *Bonn* K. Desch, B. Ketzer | *Freiburg* M. Schumacher | *RD51* E. Oliveri | *LHCb* H. Schindler

Professional development

Since 05/2019 **Postdoctoral researcher and Marie Curie Fellow**, University of Bonn

Instrumentation subgroup (≈12 members) organiser AG Ketzer and temp. AG Desch:

- Project team formation by recruitment and student training, co-supervision, coaching
- Proactive empathic leadership, strategic planning, grant applications with group leaders
- Project management, introduction/test of agile methods (Scrum, Kanban) in JIRA
- Coordination in group, at institute, in national consortia and international collaborations

Current main project (AG Ketzer, Helmholtz-Institut für Strahlen- und Kernphysik):

- Triggerless streaming readout & high-rate GEM detectors for the CERN NA66 experiment (Internal funding, project leader, co-supervisor and technical work with ∅ 2-3 students)

Secondary projects (AG Desch, Physikalisches Institut):

- Neutron detectors/electronics development (BMBF ErUM-Pro, networking, management, co-project leader, co-supervision 1 Postdoc, 2 PhDs)
- Machine Learning on FPGA (Internal funding, global networking, supervision 1 PhD)
- Photolithography micro-structuring (Internal funding, co-supervision 1 master student)

Past projects (AG Ketzer and AG Desch):

- Marie Curie (2020-2022) *A general data acquisition system to enable future experiments* (Technical work with 4 master students, management/leadership, supervision)
- BMBF ErUM-Pro (2019-2022) Neutron detectors/electronics development (Technical work, team formation master→PhDs, management/co-leadership, supervision)

2020 - 2021 Total of six months **parental leave**, of which four months with part-time work

05/2016 - 04/2019 **CERN Fellow** in the Experimental Physics Detector Technology division, European Organisation for Nuclear Research (CERN), Geneva

2010 - 2016 **Research assistant** as PostDoc (ATLAS serial powering) and PhD student, University of Bonn

2009 - 2010 **Stagiaire**, CEA Saclay, France in the group of Dr. Paul Colas, research for the diploma thesis

2005 - 2007 **Student assistant**, Fraunhofer-Institute for short-time dynamics, Freiburg, group space-craft technology: satellite component impact tests, ESA- and EADS-ASTRIUM-projects

Academic education

08/03/2016 **Doctoral degree in natural science/physics, Dr. rer. nat**, final grade: magna cum laude
PhD thesis title: *The Pixel-TPC: A feasibility study* (A "real breakthrough" according to the ECFA Detector R&D Roadmap), supervisor: Prof. Dr. Klaus Desch (University of Bonn)

2010 - 2015 **PhD student** in the detector development group of Prof. Dr. Klaus Desch
Physikalisches Institut, University of Bonn

- 28/09/2010** **Diploma in physics**, final grade: sehr gut
Diploma thesis title: *Avalanche statistics and single electron counting with a Timepix-InGrid detector*, supervisors: Dr. Paul Colas (CEA Saclay, France), Prof. Dr. Markus Schumacher (University of Freiburg)
- 2004 - 2010** **Studies of physics** at the University of Freiburg
Stays abroad (each nine months):
CEA Saclay, France: Research for the diploma thesis
University of Aberdeen, Scotland: ERASMUS Diploma Science
- 2004** **Correspondence course Physics/Mathematics** at the TU Kaiserslautern

Research funding

- Co-applied* **BMBF ErUM-Pro consortium project funding** NA66 Proton Radius measurement (2 M€)
- 2023 DFG Emmy-Noether-Programm: Invitation to final selection interview (1.9 M€, not successful)
- 2023 ERC Starting Grant: B (34-43 %) in first selection round (1.7 M€, not successful)
- 2022** **BMBF ErUM-Pro project funding** *Instrumentation for Next Generation Neutron Science* (ErUM Matter, 849 k€, with Dr. Kaminski as PI)
- 2019** **BMBF ErUM-Pro project funding** *Next Generation Readout Infrastructure for Neutron Detectors* (ErUM Matter, 857 k€, with Dr. Kaminski as PI)
- 2019** **Marie Curie Fellowship** from the European Union (175 k€)
- 2019 NRW Rückkehrprogramm: Invitation to final selection interview (1.25 M€, not successful)
- 2015** **EU AIDA-2020 WP13: Innovative Gas Detectors** (300 k€, with Prof. Desch as PI)
- Further unsuccessful applications to ErUM-Pro (AMBER with Prof. Ketzer), ErUM-Data (Consortium initiator, invitation to full proposal), DFG (Research Unit as PI for sub-project, Research Grant with Prof. Ketzer)

Internal funding/Awards/Grants

- 2022** ERC-STG application **Seed Funding**, Transdis. Research Area Matter, University of Bonn (20 k€)
- 2022** **Funding** to prepare a grant application with CEA Saclay, University of Bonn (20 k€)
- 2021** **Funding** for one student assistant to mitigate pandemic effects, University of Bonn (2 k€)
- 2019** **International cooperation grant** with ETH Zurich from the University of Bonn (1 k€)
- 2015** Conference **Trainee Grant** and Valentin T. Jordanov Radiation Instrumentation **Travel Grant** for the IEEE NSS conference in San Diego, USA
- 2013** **Georges Charpak Young Scientist Award** granted during the MPGD2013 conference in Zaragoza, Spain for my contributions to the field of modern gas detector technologies, CERN Courier Vol. 53 No. 9 33-34 (2013)
- 2009** **Stipends** by DAAD and the Freiburg University Club for stay abroad in Saclay, France

Scientific supervision of students

- Currently** Helmholtz-Institut für Strahlen- und Kernphysik (HISKP): 1 Master student
Physikalisches Institut: 1 PhD + 2 PhDs co-supervised + 1 Master student co-supervised
- Past** 1 PhD, 1 visiting CERN PhD
1 Diploma, 9 Master, 4 Bachelor
4 Student assistants, 1 ERASMUS internship, 3 CERN summer students, 1 CERN internship

Further support to early career researchers

- 2020** Recruitment and integration of a PostDoc from Turkey to Germany and the research group
- 2019** Recruitment and integration of a PhD student from India to Germany and the research group
- Since 2019** Collection of Conferences and Summer schools, promotion of participation to students
- 2011 - 2016** Pro-Buddy programme at the University of Bonn (foreign PhD student assistance)

Teaching: Training and experience

2017	Training course <i>Communication: Science or Art?</i> (1 day), CERN
2013	Seminar <i>Teaching Competencies</i> (2 days), University of Bonn
2012	Workshop <i>Educational Teaching in Particle Physics</i> (3 days), <i>Netzwerks Teilchenwelt</i>
2023/24	Bachelor seminar Presentation Techniques, tutor , 3 SWS
2023	Graduate School Detector Seminar, tutor , 3 SWS
2023	Physics II for Natural Scientists, assistant lecturer , with Prof. Brock, 6 hours
2022/23	Physics of Particle Detectors, lecturer , shared ($\approx 1/3$) with Prof. Ketzer, 4 SWS
2022	Bachelor seminar Presentation Techniques, tutor , 3 SWS
2021/22	Hands-on Master seminar: Detector Construction, lecturer , 3 SWS
2021	Advanced Gaseous Detectors - Theory and Practice (Master), lecturer , 4 SWS (cancelled) Pentecost break lecture on Special Relativity, Physics II, lecturer , 4 hours
2020/21	Physics I for Natural Scientists, head tutor , 4 SWS
2020	Master seminar Presentation Techniques, tutor/co-organiser , 3 SWS
2019/20	Particle Astrophysics (Master), head tutor , 4 SWS + lecturer substitute (2 hours)
2014	RD51 Electronics School, CERN, lecture on FPGA programming, 4 hours
2010 - 2016	Tutorships Physikalisches Institut, University of Bonn
2008 - 2009	Tutorships Physikalisches Institut, University of Freiburg

Organisation of scientific meetings, convenership

Since 2022	Organiser of the Detector Physics Seminar, University of Bonn
Since 2021	Chair of the AG Ketzer hardware group meetings, University of Bonn
Since 2021	Session Chair on DPG Spring Conferences
2022 - 2024	Organiser of two Hands-on workshops Machine Learning, University of Bonn
2019 - 2022	Co-chair of the AG Desch hardware group meetings, University of Bonn
2017 - 2021	Convener PICOSEC analysis group, weekly meetings chair, CERN
2016 - 2018	Convener, work package leader BrightnESS (Horizon2020), monthly meetings chair, CERN
2011 - 2016	Convener LCTPC-pixel working group, monthly meetings chair, University of Bonn
2012	Organiser workshop on GridPix detectors, University of Bonn

Institutional responsibilities

Since 2021	Steering Committee member Transdisciplinary Research Area Matter , University of Bonn
2021-2023	Member of a committee for a family-friendly work environment , University of Bonn
2021 -2022	Member of a professor appointment committee , University of Bonn
2007	Member of the student council at the University of Freiburg
2005 - 2010	Member of the physics student association , Freiburg: Participation in academic self-administration, professor appointment committees, bachelor and master degrees planning

National/International committees

Since 2022	(Deputy) Ex-Officio Member of the Committee for Particle Physics (KET) , Germany
Since 2022	Member of the DRD1 preparation committee (extended RD51 management board)
Since 2022	Member of the DPG particle physics section Program Advisory Board
Since 2021	Management Board Member of the young High Energy Physics Association , Germany

Reviewer in scientific journals

Since 2023	Editorial Board member Frontiers in Detector Science and Technology
Since 2017	More than ten manuscript reviews for Nuclear Inst. and Methods in Physics Research A, Journal of Instrumentation and IEEE Transactions on Nuclear Science

Major collaborations

- Since 2021** AMBER Collaboration, fundamental Hadron Physics
Since 2019 MAGIX Collaboration, fundamental Hadron and High Energy Physics
Since 2015 ATLAS Collaboration, fundamental High Energy Physics
Since 2009 LCTPC, future Linear Collider Time Projection Chamber R&D
Since 2009 RD51 Collaboration, R&D on Micro-Pattern Gaseous Detectors

Memberships of scientific societies

- Since 2020** Transdisciplinary Research Area *Matter*, University of Bonn
2015 - 2017 IEEE
Since 2010 DAAD Alumni
Since 2003 German Physics Society

Continuing education (selection)

- 2021** Compatibility of work and family, University of Bonn
2020 An eye on risks? - Export control, foreign trade law & dual-use, University of Bonn
2020 Leading for Tomorrow, German Physics Society
2018 CERN training: IQ versus EQ
2017 CERN trainings: Leading for Success; Being a Skilled Facilitator
2014 - 2015 Mentoring Programme, German Physics Society
2014 46th School for High Energy Physics, Maria Laach
2012 Hadron Collider Physics Summer School, FermiLab, USA

Outreach and science communication

- 2020** Supervisor in a **Jugend Forscht** project
2019 Mediator at **Highlights der Physik**, Bonn
2019 Supervisor in a **Netzwerk Teilchenwelt** project at CERN
Since 2017 **CERN Guide**, regular tours until 2019
2015 **Press article** *InGrids on the rise*, B. Warmbein, Linear Collider Newline
2014 - 2017 **Netzwerk Teilchenwelt** school classroom lecturer

Language skills

German: native, English: fluent, French: proficient

Publications (statistics and most relevant)

- 52 peer-reviewed or book publications
 - 48 with direct involvement, thereof 11 as first or corresponding author
 - 4 by collaboration, involved at least in review
- h-index: 10 (INSPIRE-HEP), 11 (google scholar)

Five most relevant publications

F. Jaekel, ..., **M. Lupberger**, ... et al., *An automated testing system for the RD51 VMM hybrid and yield measurement of the first production batches*

Nucl.Instr.Meth.A 1049 (2023) 168132.

F.M. Brunbauer, **M. Lupberger**, ... et al., *3D printing of gaseous radiation detectors*

JINST 14 (2019) no.12, P12005.

M. Lupberger et al., *Implementation of the VMM ASIC in the Scalable Readout System*

Nucl. Inst. Meth. A903 (2018) 91-98.

J. Bortfeldt, ..., **M. Lupberger**, ... et al., *PICOSEC: Charged particle timing at sub-25 picosecond precision with a Micromegas based detector*

Nucl. Instr. Meth. A903 (2018) 317-325.

M. Lupberger et al., *Toward the Pixel-TPC: Construction and operation of a large area GridPix detector*

IEEE Transactions on Nuclear Science 64.5 (2017) 1159-1167.

Talks (statistics and most relevant)

- 12 invited talks
- 44 talks at international conferences
- 4 posters at international conferences
- 11 talks at national conferences

Five most relevant invited talks

- 2023** **DPG Spring Conference**, Dresden, Germany
Recent advancements in Micro-Pattern Gaseous Detectors: Exciting research ahead towards future experiments
- 2022** **Rencontre du DEDIP**, CEA Saclay, France
Triggerless readout for AMBER GEMs and novel neutron detectors
- 2018** **PRISMA Detector Lab Technical Seminar**, Mainz, Germany
A next-generation readout system and its application at the NMX instrument for ESS
- 2018** **Oberseminar des II. Physikalisches Instituts**, Göttingen, Germany
A next-generation readout system and its application at the NMX instrument for ESS
- 2018** **GET workshop: General Electronics for Physics**, Talence, France
The Scalable Readout System

Five most relevant talks at international conferences

- 2022** **15th Pisa Meeting on Advanced Detectors**, La Biodola, Isola d'Elba, Italy
Particle Physics Readout Electronics and Novel Detector Technologies for Neutron Science
- 2021** **Topical Workshop on Electronics for Particle Physics 2021**, Online
The Scalable Readout System as a common initiative - a personal review
- 2018** **Topical Workshop on Electronics for Particle Physics 2018**, Antwerp, Belgium
The VMM front-end integration in the Scalable Readout System: On the way to a next generation readout system for generic detector R&D and experiment instrumentation
- 2017** **5th International Conference on Micro-Pattern Gas Detectors**, Philadelphia, USA
Implementation of the VMM in the Scalable Readout System
- 2015** **IEEE Nuclear Science Symposium & Medical Imaging Conference 2015**, San Diego, USA
The Pixel-TPC: A feasibility study



Bonn, 04/12/2023