



# Kilian Lieret

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https://lieret.net 

## EDUCATION

### Ludwig Maximilian University

PhD candidate in Experimental Particle Physics

Munich, Germany


since Oct 2018

**Adviser:** Thomas Kuhr

#### Projects:

- Determination of the CKM matrix element  $|V_{cb}|$  and search for new physics using semileptonic  $B \rightarrow D^* \ell \nu$  decays with hadronic tagging at Belle
- Calibration of the Full Event Interpretation algorithm for hadronic tagging using  $B \rightarrow X \ell \nu$  decays at Belle
- Cluster analyses of kinematic distributions to determine sensitivities to new physics and to estimate dependencies of experimental results on theoretical models
- Maintenance of the Belle II validation framework for software performance testing and validation

### Ludwig Maximilian University and Technical University of Munich

Elite MSc Course Theoretical and Mathematical Physics 

Munich, Germany

Oct 2014 – Sep 2018

**Thesis:** Construction of Angular Observables Sensitive to New Physics in  $\bar{B} \rightarrow D^* \tau^- \bar{\nu}_\tau$  Decays and Measurements of Differential Cross Sections of  $\bar{B} \rightarrow D^* \ell^- \bar{\nu}_\ell$  Decays with Hadronic Tagging at Belle\*

**Final grade:** 1.31

### Ludwig Maximilian University

BSc in physics

Munich, Germany

Oct 2011 – Sep 2015

**Thesis:** Truth-level based estimation of the sensitivity to phenomenological minimal supersymmetric standard models in events with one hard lepton\*

**Final grade:** 1.29

### Ludwig Maximilian University

BSc in mathematics (minor: theoretical physics)

Munich, Germany

Oct 2011 – Aug 2014

**Thesis:** Elliptic Functions\*

**Final grade:** 1.04 (best of my semester)

## RESEARCH STAYS AND INTERNSHIPS

### University of Tokyo


Research stay

Tokyo, Japan

Dec 2017 – Feb 2018

**Project:** Search for New Physics in  $B \rightarrow D^{(*)} \tau \bar{\nu}_\tau$  decays

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\* Full text available at [lieret.net/research](https://lieret.net/research) 

**Tokyo Institute of Technology** <sup>↗</sup>  
Research oriented summer school  
**Project:** Complex Organic Molecules in Protoplanetary Disks

**Tokyo, Japan**  
Jul 2017 – Sep 2017

**Nagoya University** <sup>↗</sup>  
Nagoya University Program for Academic Exchange <sup>↗</sup>

**Nagoya, Japan**  
Sep 2015 – Sep 2016

**LHCb** <sup>↗</sup>, **CERN** <sup>↗</sup>  
Research oriented summer school  
**Project:** Data Acquisition Performance Analysis

**Geneva, Switzerland**  
Jul 2015 – Sep 2015

## LEADERSHIP AND COORDINATION

**Belle II Collaboration** <sup>↗</sup>  
Convener of the Software Documentation and Training Working Group

since 2020

**HEP Software Foundation** <sup>↗</sup>  
One of three conveners of the Software Training and Careers Working Group <sup>↗</sup>

2020

**Quod Erat Demonstrandum e.V.** <sup>↗</sup>  
Secretary to the board, vice-secretary to the board  
Responsible for paperwork, website, communication with sponsors and advertising efforts of a registered association that promotes mathematically talented pupils and young students

2014 – 2016

## SCHOLARSHIPS

**University of Tokyo** <sup>↗</sup>  
Short-term scholarship

Dec 2017 – Feb 2018

**Tokyo Institute of Technology** <sup>↗</sup>  
Short-term scholarship

Jul 2017 – Sep 2017

**German Academic Exchange Service (DAAD)** <sup>↗</sup>  
One-year scholarship for studies in Japan

Sep 2015 – Aug 2016

**Max Weber-Program of the state of Bavaria** <sup>↗</sup>  
Financial and academic support throughout BSc/MSc studies

Dec 2013 – Oct 2017

**German National Academic Foundation** <sup>↗</sup>  
Financial and academic support throughout BSc/MSc studies

Apr 2013 – Jun 2018

## SELECTED AWARDS

**Most creative team**  
For a project on selective background MC generation at the Deep Learning Hackathon #d3hack2019 <sup>↗</sup>

Sep 2019

- Best Presentation Award** Sep 2017  
 For summer project at Tokyo Institute of Technology Tokyo Institute of Technology <sup>↗</sup>
- Main prize Best Overall Project** Aug 2015  
 As team leader of “Information Please” at the CERN <sup>↗</sup> webfest (“hackathon”)
- Multiple awards** 2007 – 2011  
 Many successful participations in *Landeswettbewerb Mathematik Bayern* (Bavarian Math Competition) and *Bundeswettbewerb Mathematik* (Federal Math Competition)

## SELECTED PUBLICATIONS

### Published:

- [1] Jason Aebischer, Thomas Kuhr, and Kilian Lieret. Clustering of  $\bar{B} \rightarrow D^{(*)} \tau^- \bar{\nu}_\tau$  kinematic distributions with ClusterKinG. *JHEP*, 04:007, 2020. arXiv:1909.11088 <sup>↗</sup>, doi:10.1007/JHEP04(2020)007 <sup>↗</sup>.
- [2] James Kahn, Emilio Dorigatti, Kilian Lieret, Andreas Lindner, and Thomas Kuhr. Selective background Monte Carlo simulation at Belle II. *EPJ Web Conf.*, 245:02028, 2020. doi:10.1051/epjconf/202024502028 <sup>↗</sup>.

### Submitted:

- [3] Sudhir Malik, Samuel Meehan, Kilian Lieret, et al. Software Training in HEP. 2021. Submitted to CSBS. arXiv:2103.00659 <sup>↗</sup>.

### In preparation:

- [4] Kilian Lieret, Thomas Kuhr, Florian Bernlochner, and Felix Metzner. Calibration of the Full Event Reconstruction hadronic tagging algorithm using  $B \rightarrow X \ell \nu$  decays at Belle. In preparation.
- [5] Markus Prim, Kilian Lieret, Thomas Kuhr, Florian Bernlochner, and Felix Metzner. Determination of the CKM matrix element  $|V_{cb}|$  and search for new physics using semileptonic  $B \rightarrow D^* \ell \nu$  decays with hadronic tagging at Belle. In preparation.

## TALKS

- Training: Community Building <sup>↗</sup>, HSF WLCG Virtual Workshop <sup>↗</sup>, Nov 2020
- Programming paradigms and Software Design Patterns (lecture and exercises), Inverted CERN School of Computing <sup>↗</sup>, Sep-Oct 2020
- Experimental aspects of  $R(D)$ ,  $R(D^*)$  <sup>↗</sup>, Beyond the Standard Model with prevision flavour experiments <sup>↗</sup>, Munich, May, 2020
- Angular Observables Sensitive to NP in  $B \rightarrow D^* \ell \nu$  <sup>↗</sup>, Hints for New Physics in Heavy Flavors <sup>↗</sup>, Nagoya, Nov 2018
- $B \rightarrow D^{(*)} \ell \nu$  at Belle/Belle II <sup>↗</sup> 10th International Workshop on the CKM Unitarity Triangle <sup>↗</sup>, Heidelberg, Sep 2018

## OPEN SOURCE PROJECTS

I have authored more than 20 open source projects, most of them listed at [lieret.net/opensource](http://lieret.net/opensource) and available on [github.com/klieret](https://github.com/klieret). Among these

- [ClusterKinG](#) [1] clusters kinematic distributions in particular for HEP purposes
- [AnkiPandas](#) interfaces [Anki](#) (a popular spaced repetition program) with [pandas](#)
- [sunburst](#) draws sunburst charts (a.k.a. ring charts, hierarchical pie charts)

## LANGUAGES

- German: native
- English: near-native (C2\*), TOEFL iBT: 115<sup>†</sup> (Nov 2014)
- Japanese: upper-intermediate/pre-advanced (B2/C1), JLPT N2<sup>‡</sup> (Jul 2016)
- French: upper-intermediate (B2)

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\* Common European Framework of Reference for Languages, a scale ranging from A1 (beginner) to C2 (near native)

<sup>†</sup> Test of English as a Foreign Language. The iBT score ranges from 0 to 120.

<sup>‡</sup> Japanese-Language Proficiency Test. Scale of five levels: N5 (beginner) to N1