Frank Siegert — Curriculum Vitae

Contact Information

Institut für Kern- und Teilchenphysik
TU Dresden
Zellescher Weg 19
D-01069 Dresden
Germany

Phone +49-(0)351-463-33700
Email frank.siegert@tu-dresden.de
WWW https://tu-dresden.de/mn/physik/iktp/
Office Andreas-Schubert-Bau, ASB E17

Personal Details

Year of birth 1982
Citizenship German

Research Interests

High energy physics, LHC phenomenology, ATLAS analyses, Monte-Carlo event generators, higher-order calculations, prompt photon production, heavy flavour production, vector boson scattering

Positions

since 2021

Acting Professor, Chair of Particle Physics
TU Dresden

2014-2021

Emmy Noether junior research group leader
TU Dresden

[03/04/2016–03/08/2016 Parental leave]

2013–2014

Postdoctoral research associate
TU Dresden

2010–2013

Postdoctoral research associate
University of Freiburg

Education

01/10/2007–30/09/2010 PhD Physics

Marie Curie Early-Stage Researcher joint between two MCnet nodes

- Institute for Particle Physics Phenomenology, Durham University
- High Energy Physics Group, University College London

Advisors

- Dr. Frank Krauss (IPPP)
- Prof. Jonathan Butterworth (UCL)

01/10/2002–30/09/2007 Undergraduate Physics

Institut für Theoretische Physik
TU Dresden, Dresden (Germany)

Advisors

- Dr. Frank Krauss
- Prof. Dr. Heiko Lacker

Diploma Thesis: "Simulation of hadron decays in SHERPA"

01/09/1988–22/06/2001 Primary and Grammar School

1998–1999 Foreign exchange student, Missouri, USA

2001 "Abitur" at Gymnasium Dresden-Gruna

APPOINTMENTS AND AWARDS

since 2022

Convener of ATLAS subgroup Jet and Photon Physics

March 2023

Local Chair, DPG Spring Meeting Dresden (2500 participants)

2017-2019

Convener of ATLAS Physics Modelling Group

2015-2021

TU Dresden Young Investigator

2015–2018

Faculty Council
School of Science, TU Dresden

(Elected member)

2015–2017

Department Council
School of Science, Department of Physics, TU Dresden

(Elected member)

2015-2016

Convener of ATLAS PMG MC Performance Subgroup

2015-2021

DFG Emmy Noether Group Leader

June 2011

IoP Annual PhD Thesis Prize 2010 Computational Physics

PUBLICATIONS

29 journal publications without ATLAS collaboration, including:

- 2 publications with >1000 citations
- 3 publications with 500-1000 citations
- 11 publications with 100-500 citations

(h index: 24)

>1000 journal publications together with the ATLAS collaboration, including:

- 1 publication with >14000 citations
- 10 publications with >1000 citations

Selected Publications

1. **"Modelling and computational improvements to the simulation of single vector-boson plus jet processes for the ATLAS experiment"**
   ATLAS Collaboration
   JHEP **08** (2022), 089 [arXiv:2112.09588]

2. **"Accelerating Monte Carlo event generation – rejection sampling using neural network event-weight estimates"**
   K. Danziger, T. Janßen, S. Schumann and F. Siegert,
   SciPost Phys. **12** (2022), 164 [arXiv:2109.11964]

3. **"Measurement of the production cross section of pairs of isolated photons in pp collisions at 13 TeV with the ATLAS detector"**
   ATLAS Collaboration
   JHEP **11** (2021), 169 [arXiv:2107.09330]

4. **"Event Generation with Sherpa 2.2,"**
   E. Bothmann *et al.* [Sherpa],
   SciPost Phys. **7** (2019) no.3, 034 [arXiv:1905.09127]

5. **"Multijet Merging in a Variable Flavor Number Scheme"**
   S. Höche, J. Krause and F. Siegert,
   Phys. Rev. D **100** (2019) 014011 [arXiv:1904.09382]

6. **"Momentum conservation and unitarity in parton showers and NLL resummation"**
   S. Höche, D. Reichelt and F. Siegert
   JHEP **1801** (2018) 118 [arXiv:1711.03497]

7. **"Measurement of the k_{t} splitting scales in $Z \to \ell\ell$ events in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector"**
   ATLAS Collaboration
   JHEP **1708** (2017) 026 [arXiv:1704.01530]

8. **"A practical guide to event generation for prompt photon production"**
   F. Siegert
   J. Phys. **G44** (2017) 044007 [arXiv:1611.07226]

9. **"Next-to-leading order QCD predictions for top-quark pair production with up to three jets"**
   S. Höche, P. Maierhoefer, N. Moretti, S. Pozzorini, F. Siegert
   Eur. Phys. J. C **77** (2017) 145 [arXiv:1607.06934]

10. **"Measurement of k_{T} splitting scales in $W \to \ell\nu$ events at $\sqrt{s}$ = 7 TeV with the ATLAS detector"**
    ATLAS Collaboration
    Eur. Phys. J. C **73** (2013) 2432 [arXiv:1302.1415]

11. **"QCD matrix elements + parton showers: The NLO case"**
S. Höche, F. Krauss, M. Schönherr and F. Siegert
JHEP **1304** (2013) 027 [arXiv:1207.5030]

12. **"W+n-jet predictions with MC@NLO in Sherpa"**
S. Höche, F. Krauss, M. Schönherr and F. Siegert
Phys. Rev. Lett. **110** (2013) 052001 [arXiv:1201.5882]

13. **"QCD matrix elements and truncated showers"**
S. Höche, F. Krauss, S. Schumann and F. Siegert
JHEP **0905** (2009) 053 [arXiv:0903.1219]

14. **"Event generation with SHERPA 1.1"**
T. Gleisberg, S. Höche, F. Krauss, M. Schönherr, S. Schumann, F. Siegert and J. Winter
JHEP **0902** (2009) 007 [arXiv:0811.4622]

University Teaching

since 2022 TU Dresden (Master Physics)
Organiser of advanced lab courses in Particle and Nuclear Physics

Apr 2023–Aug 2023 TU Dresden (Master Physics)
Lecturer: Advanced concepts of particle physics

Oct 2022–Feb 2023 TU Dresden (Bachelor Physics)
Lecturer and tutor: Introduction to Particle and Nuclear Physics

Apr 2022–Aug 2022 TU Dresden (Teachers' Programme)
Co-Lecturer: Introduction to Particle and Nuclear Physics for Teachers

Apr 2022–Aug 2022 TU Dresden (Master Physics)
Lecturer: Advanced concepts of particle physics

Oct 2021–Feb 2022 TU Dresden (Bachelor Physics)
Lecturer: Introduction to Particle and Nuclear Physics

Apr 2021–Aug 2021 TU Dresden (Master Physics)
Lecturer: Advanced concepts of particle physics

Oct 2020–Feb 2021 TU Dresden (Master Physics)
Lecture assistant/tutor: Key concepts of Experimental Physics

Apr 2020–Aug 2020 TU Dresden (Master Physics)
Hauptseminar "The Statistical Tools Behind Important Results in Particle Physics"

Apr 2017–Aug 2017 TU Dresden (Master Physics)
Hauptseminar "Particle physics phenomena that influence the (far) future of the Universe"

Oct 2016–Feb 2017 TU Dresden (Bachelor Physics)
Lecturer: Introduction to Particle and Nuclear Physics

Oct 2015–Feb 2016 TU Dresden (Bachelor Physics)
Lecturer: Introduction to Particle and Nuclear Physics

Apr 2015–Aug 2015 TU Dresden (Master Physics)
Lecturer: Advanced Quantum Field Theory/QCD

Oct 2014–Feb 2015 TU Dresden (Master Physics)
Hauptseminar: Monte Carlo-Methods

Oct 2013–Aug 2014 TU Dresden (Master Physics)
Lecture assistant/tutor: Key concepts of Experimental Physics

Oct 2013–Feb 2014 TU Dresden (Master Physics)
Hauptseminar: Monte Carlo-Methods

Apr 2013–Aug 2013 Universität Freiburg (Bachelor Physics)
Lecture assistant/tutor: Theoretical Physics IV (Quantum Mechanics)

Oct 2012–Feb 2013 Universität Freiburg (Bachelor Physics)
Lecture assistant/tutor: Theoretical Physics III (Elektrodynamics & Special Relativity)

Apr 2012–Aug 2012 Universität Freiburg (Bachelor Physics)
Lecture assistant/tutor: Experimental Physics II (Elektrodynamics)

Oct 2011–Feb 2012 Universität Freiburg (Bachelor Physics)
Lecture assistant/tutor: Theoretical Physics III (Elektrodynamics & Special Relativity)

Apr 2011–Aug 2011 Universität Freiburg (Bachelor Physics)
Lecture assistant/tutor: Experimental Physics II (Elektrodynamics)

Jan 2010–Mar 2010 Durham University (MPhys)
Tutor: Computational Physics

OUTREACH

1. Was die Welt im Innersten zusammenhält
   Scientific Barhopping, March 2023, Dresden
2. Der Zufall in der (Teilchen-)Physik
   Public lecture series "Physik am Samstag", December 2022, TU Dresden
3. Was lange währt…
   Public evening lecture, Higgs @ 10, July 2022, TU Dresden
4. Statistik und Hypothesentests
   Teacher training, Forschung trifft Schule @ Home, March 2021, December + September 2020
5. Was die Welt im Innersten zusammenhält – Teilchenphysik am Large Hadron Collider
   Public lecture, LernortLabor Jugendtagung, March 2020
6. Scinema: Die Jagd nach dem Higgs – Particle Fever
   Public evening lecture + movie screening, Kino im Kasten, October 2019
7. Zwischen Experiment und Lagrangedichte: Wirkungsquerschnitte und Feynman-Diagramme
   Teacher training, Forschung trifft Schule Summer School CERN, July 2018
8. Glauben Physiker an die Apokalypse? Higgsteilchen und die Instabilität des Universums
   Public evening lecture, Evangelische Studierendengemeinde Dresden, January 2017
9. Was die Welt im Innersten zusammenhält – Teilchenphysik am Large Hadron Collider
   Public evening lecture, Lange Nacht der Wissenschaften Dresden, July 2015
10. 60 Jahre Teilchenphysik am CERN
    Public evening lecture for CERN60 celebration week, TU Dresden, October 2014
11. Was die Welt im Innersten zusammenhält – Teilchenphysik am Large Hadron Collider
    Public evening lecture, Lange Nacht der Wissenschaften Dresden, July 2014
12. International Masterclasses – hands on particle physics
    Wie wir nach dem Higgs-Boson suchen: Beschleuniger und Detektoren (German)
    International Masterclass 2014, TU Dresden, March 2014
13. Various master class events in local schools, 2013-2014
14. Winning presentation about "Monte-Carlo methods for the LHC", Science Slam Physics ("Tag der Weltmaschine"), Freiburg, November 2011

STUDENT SUPERVISION

PhD theses

3 students finished since 2015

5 students currently under supervision

Master theses

6 students finished since 2014

2 students currently under supervision

Bachelor theses

>20 students finished since 2016