

UNIVERSITY OF MILAN

Public selection for recruiting No. 1 tenure track researcher(s) (RTT) for competition sector 02/A2 - Fisica Teorica delle Interazioni Fondamentali, (scientific-disciplinary sector PHYS-02/A - Fisica teorica delle interazioni fondamentali, modelli, metodi matematici e applicazioni) at the Dipartimento di Fisica Aldo Pontremoli, (announcement published in Official Gazette No. 4011/2024 of 12/06/2024) - Competition code 5577

Theo Heimel

CURRICULUM VITAE

(N.B. CV MUST BE OF UP TO 30 PAGES AND INCLUDE THE DETAILS CANDIDATES CONSIDER USEFUL FOR THE ASSESSMENT.

ALL THE TITLES INSERTED BELOW ARE JUST EXAMPLES THAT CAN BE REPLACED, CHANGED OR COMPLETED)

PERSONAL DATA (DO NOT INCLUDE YOUR PERSONAL ADDRESS AND LANDLINE OR MOBILE PHONE NUMBER)

SURNAME	HEIMEL
NAME	THEO
DATE OF BIRTH	07.11.1996

QUALIFICATIONS

DEGREE

(Specify full degree name and related score, University, date, thesis title, etc.)

<p>Bachelor's degree in Physics, Heidelberg University, 10/2015 – 09/2018 Final grade: 1.0 (very good) Thesis: "The Anti-QCD Tagger – Using Autoencoders to Find Anomalies in Jet Substructure" Supervisor: Tilman Plehn</p> <p>Master's degree in Physics, Heidelberg University, 10/2018 – 03/2021 Final grade: 1.0 (very good) Thesis: "Measuring QCD Splittings with Invertible Neural Networks" Supervisor: Tilman Plehn</p>

DOCTORAL DEGREE OR EQUIVALENT QUALIFICATION EARNED IN ITALY OR ABROAD / MEDICAL SPECIALISATION DIPLOMA OR EQUIVALENT QUALIFICATION, FOR THE RELEVANT SECTORS, EARNED IN ITALY OR ABROAD

(Specify qualification full name and related score, institution, date, thesis title, etc.)

PhD in Theoretical Particle Physics, 04/2021 – 04/2024
Institute for Theoretical Physics, Heidelberg University
Final grade: summa cum laude (very good)
Thesis: "The Flow of LHC Events - Generative models for LHC simulations and inference"
Supervisor: Tilman Plehn
Supported by:
research training group "Particle Physics beyond the Standard Model", 04/2021 – 03/2023
Carl-Zeiss-Stiftung, "Model-Based AI: Physical Models and Deep Learning for Imaging and Cancer Treatment", 04/2023 – 04/2024

RESEARCH CONTRACTS, RESEARCH FELLOWSHIP CONTRACTS, POSTDOCTORAL SCHOLARSHIPS OR SIMILAR CONTRACTS

(Specify, for each contract, university/institution, starting and termination date, duration in years, etc.)

Postdoctoral researcher, 05/2024 – 09/2024
Institute for Theoretical Physics, Heidelberg University

Postdoctoral researcher, starting 10/2024
Centre for Cosmology, Particle Physics and Phenomenology, Université Catholique de Louvain

TEACHING ACTIVITIES AT ITALIAN OR FOREIGN UNIVERSITIES

(Specify academic year, university, degree course, number of hours/CFU, indicate type of activity, start and end date - day, month, year, etc.)

Physics meets Artificial Intelligence, 09/2022
ASC school, LMU Munich, 2 tutorials, 90 minutes each

Standard Model of Particle Physics, 04/2022 – 08/2022
Tutorial, 2 hours/week

Theoretical Statistical Physics, 10/2021 – 02/2022
Tutorial, 2 hours/week

Analytical Mechanics and Thermodynamics, 04/2021 – 08/2021
Tutorial, 2 hours/week

Quantum Mechanics, 04/2020 – 08/2020
Tutorial, 2 hours/week

STUDENT CO-SUPERVISION

Jona Ackerschott, Master's student, 06/2022 – 08/2023
Simon Pijahn, Bachelor's student, 10/2021 – 03/2022
Joran Köhler, Bachelor's student, 10/2021 – 03/2022
Sophia Vent, Bachelor's student, 04/2021 – 10/2021
Sander Hummerich, Bachelor's student, 04/2021 – 10/2021
Tobias Krebs, Bachelor's student, 04/2021 – 10/2021

SPEAKING AT NATIONAL AND INTERNATIONAL CONFERENCES AND CONVENTIONS

(Specify conference/convention title, date, duration in days/hours, organizing institution, etc.)

ML4Jets, Hamburg, 11/2023

"The MadNIS Reloaded"

Hammers&Nails, Ascona, 10/2023

"Precision Maching Learning for the Matrix Element Method"

Madgraph Meeting, Gargnano, 09/2023

Invited talk, "MadNIS – Madgraph Neural Importance Sampling"

Pheno, Pittsburgh, 05/2023

"MadNIS – Madgraph Neural Importance Sampling"

ALPS, Obergurgl, 03/2023

"Two Invertible Networks for the Matrix Element Method"

Machine Learning Galore Meeting, Heidelberg, 01/2023

Invited talk, "Normalizing Flows for LHC Physics"

UC Louvain, Seminar, 01/2023

"Two Invertible Networks for the Matrix Element Method"

ML4Jets, Rutgers University, 11/2022

"Two Invertible Networks for the Matrix Element Method"

ACAT, Bari, 10/2022

"Two Invertible Networks for the Matrix Element Method"

IML Meeting, CERN, 10/2022

Online talk, "Two Invertible Networks for the Matrix Element Method"

Bayesian Inference in HEP, IPPP Durham, 05/2022

Invited talk, "Measuring QCD Splittings with Invertible Neural Networks"

Rutgers University, 05/2022

Online seminar, "Generative Networks for Precision Enthusiasts"

Pheno, Pittsburgh, 05/2022

"Generative Networks for Precision Enthusiasts"

IRN Terascale, Bonn, 03/2022

"Invertible Networks for the Matrix Element Method"

Humboldt University Berlin, Seminar, 01/2022

Seminar, "The Matrix Element Method meets Invertible Neural Networks"

ML4Jets, Heidelberg University, 07/2021

"Measuring QCD Splittings with Invertible Networks"

Fermilab, Online seminar, 02/2021

Online seminar, "Measuring QCD Splittings with Invertible Networks"

SCIENTIFIC PRODUCTION

SCIENTIFIC PUBLICATIONS

(For each publication, specify the following: authors' names, full title, publisher, date and place of publication, ISBN/ISSN/DOI or equivalent code)

04/2024, "The Landscape of Unfolding with Machine Learning",
with N. Huetsch, J. Villadamigo, A. Shmakov, S. Diefenbacher, V. Mikuni, M. Fenton, K. Greif,
B. Nachman, D. Whiteson, A. Butter, T. Plehn,
submitted to SciPost, arXiv:2404.18807 [hep-ph].

11/2023, "The MadNIS Reloaded",
with N. Huetsch, F. Maltoni, O. Mattelaer, T. Plehn, R. Winterhalder,
submitted to SciPost, arXiv:2311.01548 [hep-ph].

10/2023, "Precision-Machine Learning for the Matrix Element Method",
with N. Huetsch, R. Winterhalder, T. Plehn, A. Butter,
submitted to SciPost, arXiv:2310.07752 [hep-ph].

08/2023, "Returning CP-Observables to The Frames They Belong",
with J. Ackerschott, R. Barman, D. Gonçalves, T. Plehn,
SciPost Phys. 17 (2024) 001, arXiv:2308.00027 [hep-ph].

05/2023, "How to Understand Limitations of Generative Networks",
with R. Das, L. Favaro, C. Krause, T. Plehn, D. Shih,
SciPost Phys. 16 (2024) 031, arXiv:2305.16774 [hep-ph].

12/2022, "MadNIS – Neural Multi-Channel Importance Sampling",
with R. Winterhalder, A. Butter, J. Isaacson, C. Krause, F. Maltoni, O. Matte-
laer, T. Plehn,
SciPost Phys. 15 (2023) 141, arXiv:2212.06172 [hep-ph].

10/2022, "Two Invertible Networks for the Matrix Element Method",
with A. Butter, T. Martini, S. Peitzsch, T. Plehn,
SciPost Phys. 15 (2023) 094, arXiv:2210.00019 [hep-ph].

10/2021, "Generative Networks for Precision Enthusiasts",
with A. Butter, S. Hummerich, T. Krebs, T. Plehn, A. Rousselot, S. Vent,
SciPost Phys. 14 (2023) 078, arXiv:2110.13632 [hep-ph].

12/2020, "Measuring QCD Splittings with Invertible Networks",
with S. Bieringer, A. Butter, S. Höche, U. Köthe, T. Plehn, S. Radev,
SciPost Phys. 10 (2021) 126, arXiv:2012.09873 [hep-ph].

08/2018, "QCD or What?",
with G. Kasieczka, T. Plehn, J. Thompson,
SciPost Phys. 6 (2019) 030, arXiv:1808.08979 [hep-ph].

Date

17.07.2024

Place

Heidelberg, Germany