

# Ismail Soudi

## Curriculum Vitae

[isma@physik.uni-bielefeld.de](mailto:isma@physik.uni-bielefeld.de) | Male, Born 1995 | Nationality: Morocco

*"After all, I was born not knowing and have only had a little time to change that here and there." — Richard P. Feynman*

## Professional Experience

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| Oct 2025 – Present   | <b>Akademischer Rat</b> — University of Bielefeld, Bielefeld, Germany                                                |
| Nov 2023 – Sept 2025 | <b>Postdoctoral Researcher</b> — University of Jyväskylä, Jyväskylä, Finland<br>With: Kari J. Eskola and Harri Niemi |
| Nov 2021 – Oct 2023  | <b>Postdoctoral Researcher</b> — Wayne State University, Detroit, USA<br>With: Abhijit Majumder                      |

## Education

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| 2018 – 2021 | <b>PhD in Physics</b> — Bielefeld University, Bielefeld, Germany<br>Thesis: "Jet fragmentation in QCD medium" with Soeren Schlichting                                                  |
| 2016 – 2018 | <b>MSc in Theoretical Physics</b> — University of Wroclaw, Wroclaw, Poland<br>Thesis: "Meson dissociation in hot, dense matter within the Beth-Uhlenbeck approach" with David Blaschke |
| 2015 – 2016 | <b>1st Year MSc in Fundamental Physics</b> — Université Pierre et Marie Curie, Paris, France                                                                                           |
| 2012 – 2015 | <b>Bachelor's in Fundamental Physics</b> — Université Pierre et Marie Curie, Paris, France                                                                                             |

## Scholarships and Graduate School

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| 2018 – 2021 | <b>HGS-HIRe for FAIR Fellowship</b><br>Travel fund (1K EUR per year) |
| 2019 – 2021 | <b>Bielefeld Graduate School in Theoretical Sciences (BGTS)</b>      |

## Research Experience

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| Oct 2025 – Present   | <b>Member</b> — CRC-TR 211<br>'Strong-interaction matter under extreme conditions' – TRR 211               |
| Nov 2023 – Sept 2025 | <b>Member</b> — Centre of Excellence in Quark Matter<br>Research Council of Finland's Centre of Excellence |
| Nov 2023 – Sept 2025 | <b>Member</b> — YoctoLHC Collaboration<br>ERC Advanced Grant                                               |

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| Nov 2021 – Present  | <b>Member</b> — JETSCAPE Collaboration<br>NSF-funded research collaboration                                                                                                        |
| Nov 2018 – Nov 2021 | <b>Junior Member</b> — CRC-TR 211<br>'Strong-interaction matter under extreme conditions' – TRR 211                                                                                |
| Jul – Sep 2018      | <b>Erasmus Internship</b> — Institute of Space Sciences & Astronomy, Malta<br>Gravitational waves in modified symmetric Teleparallel Gravity. With Dr. Jackson Levi Said           |
| Oct 2017 – Jun 2018 | <b>Paid Internship</b> — Institute of Theoretical Physics, Wroclaw, Poland<br>Meson dissociation in hot, dense matter. With Prof. David Blaschke                                   |
| May – Jun 2016      | <b>Internship</b> — Orsay Laboratory of Theoretical Physics, Orsay, France<br>Particle physics: QCD and QED Feynman diagram calculations. With Dr. Samuel Wallon                   |
| Jan 2015            | <b>Internship</b> — Institut d'Astrophysique de Paris, Paris, France<br>Astronomical spectroscopy: interstellar clouds studied by visible/UV spectroscopy. With Dr. Patrick Boissé |

## Teaching Experience

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|----------------|-----------------------------------------------------------------------------|
| Winter 2024/25 | <b>Exercises in Advanced Quantum Field Theory</b> — University of Jyväskylä |
| Winter 2020/21 | <b>Exercises in Non-equilibrium Physics</b> — Bielefeld University          |

## Languages

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**Arabic** (Native), **French** (Native), **English** (Fluent)

## Computer Skills

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**Programming for Physics:** C++, Mathematica (xAct), Python, Julia, SageMath (SageManifolds), Fortran

**Web & Other:** HTML, CSS, JavaScript, LaTeX, Typst

## Invited Talks (13)

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1. *Small systems: theory overview - energy loss*  
Large Hadron Collider Physics 2025  
 National Taiwan University, Taipei, Taiwan (2025-05-09)  | 
2. *Theory overview of medium response and hard-soft correlation*  
Quark Matter 2025  
 Frankfurt, Germany (2025-04-10)  | 
3. *Jets in small systems*  
High energy probes of the initial stages  
 CERN, Geneva, Switzerland (2025-04-03)  | 
4. *Finite size effects on jet thermalization*  
Light ion collisions at LHC  
 CERN, Geneva, Switzerland (2024-11-14)  | 
5. *Thermalization of jets in QCD plasma*  
Jet Modification and Hard-Soft Correlations  
 Tokyo, Japan (2024-09-29)  | 
6. *Jets: Hard-soft correlation - Theory overview*  
Hard Probes 2024  
 Nagasaki, Japan (2024-09-26)  | 
7. *Studying small systems using a multi-stage approach*  
New jet quenching tools to explore equilibrium and non-equilibrium dynamics in heavy-ion collisions  
 ECT\*, Trento, Italy (2024-02-14)  | 
8. *High- $p_T$  azimuthal anisotropies in  $p$ - $p$  and  $p$ - $A$  from transverse momentum dependent distributions*  
University of Michigan  
 Ann Arbor, MI (2023-10-11)
9. *Thermalization of highly energetic partons in a QCD plasma*  
QCD Theory Group at UCLA  
 Los Angeles, USA (2023-02-09) 
10. *Thermalization of highly energetic partons in a QCD plasma*  
McGill University  
 Montreal, Canada (2023-02-01) 
11. *Thermalization of highly energetic partons in a QCD plasma*  
RBRC Workshop: Predictions for sPHENIX (Cyber)  
 BNL, Upton NY, USA (2022-07-21) 
12. *Energy loss and equilibration of a highly energetic parton in QCD plasmas*  
University of Bergen  
 Bergen, Norway (2022-01-18)
13. *Non-perturbative contribution to the collisional broadening and medium induced radiation in QCD plasmas*  
CERN TH Heavy Ion group  
 Geneva, Switzerland (2021-05-31)  | 

## Presentations (20)

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1. *Studying high  $p_T$  momentum azimuthal anisotropies in unpolarized proton-proton collisions using transverse momentum dependent (TMD) parton distribution and fragmentation functions*  
SPIN 2023  
 Durham, NC (2023-09-26)  | 
2. *Azimuthal anisotropies at high  $p_T$  from transverse momentum dependent (TMD) parton distribution and fragmentation functions*  
Quark Matter 2023  
 Houston, TX (2023-09-05)  | 
3. *High transverse momentum azimuthal anisotropy from initial-state correlations in  $p$ - $p$  and  $p$ - $A$  collisions*  
INT Program: Probing QCD at High Energy and Density with Jets  
 Seattle, Washington (2023-10-18)  | 
4. *Studying small systems using a multi-stage approach*  
APS April Meeting - GHP 2023  
 Minneapolis, MN (2023-04-01)  | 
5. *Monte Carlo methods in jet physics (lecture)*  
JETSCAPE Summer School 2023  
 Online (2023-07-01) 
6. *Studying small systems using a multi-stage approach*  
14th Conference on the Intersections of Particle and Nuclear Physics  
 Orlando, FL (2022-09-03)  | 
7. *Jet-medium excitations (lecture)*  
JETSCAPE Online Summer School 2022  
 Online (2022-08-01)  | 
8. *Non-perturbative determination of the collisional broadening kernel and medium-induced radiation in QCD plasmas*  
Quark Matter 2022 (Cyber)  
 Kraków, Poland (2022-04-07)  | 
9. *Non-perturbative contribution to the collisional broadening and determination of the in-medium splitting*  
The virtual DPG-Tagung (DPG Meeting) of the Matter and Cosmos Section (SMuK)  
 Online (2021-09-02)  | 
10. *Non-perturbative contribution to the collisional broadening and determination of the in-medium splitting*  
INT Program 21-2b: Probing QCD at High Energy and Density with Jets (Cyber)  
 Seattle, Washington (2021-08-11)  | 
11. *Non-perturbative phenomena in jet modification*  
A Virtual Tribute to Quark Confinement and the Hadron Spectrum 2021  
 Online (2021-08-05)  | 
12. *Non-perturbative contribution to the collisional broadening and medium induced radiation in QCD plasmas*  
CRC-TR 211 Meeting and Colloquium (Cyber)  
 Frankfurt, Germany (2021-06-30)
13. *Fragmentation and equilibration of jets in a QCD plasma*  
Zimany School 2020 (Cyber)  
 Budapest, Hungary (2020-12-10)
14. *Teleparallel gravity: the forgotten theory of gravity*  
University of Bielefeld - BGTS Day  
 Bielefeld, Germany (2020-10-02)

15. *Fragmentation and equilibration of jets in a QCD plasma*  
Hard Probes 2020 (Cyber)  
 Austin, Texas (2020-06-02)
16. *Kinetic and chemical equilibration of jets*  
CRC-TR 211 Meeting and Colloquium (Cyber)  
 Darmstadt, Germany (2020-04-24)
17. *Jet-medium interactions*  
CRC-TR 211 lecture week  
 Limburg, Germany (2019-12-13)
18. *Early time dynamics of heavy-ion collisions*  
University of Bielefeld - BGTS Day  
 Bielefeld, Germany (2019-10-25)
19. *Generalized Beth-Uhlenbeck approach to mesons and diquarks in hot, dense quark matter*  
Institute of theoretical physics  
 Wroclaw, Poland (2018-03-19)
20. *PNJL Model*  
Institute of theoretical physics  
 Wroclaw, Poland (2017-02-26)

## Posters (2)

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1. *Medium induced shower in an expanding QCD plasma*  
Hard Probes 2024  
 Nagasaki, Japan (2024-09-24)
2. *Fragmentation and equilibration of jets in a QCD plasma*  
PC2 User Meeting 2020  
 Paderborn, Germany (2020-11-26)

### Publications (23)

1. Souidi, I. et al., *Soft-hard framework with exact four-momentum conservation for small systems*, *Phys. Rev. C* **112**, 014905 (2025)
2. Souidi, Ismail, Majumder, Abhijit, *T-odd parton distribution functions and azimuthal anisotropy at high transverse momentum in p-p and p-A collisions*, *Phys. Rev. C* **111**, 024901 (2025)
3. Souidi, Ismail, Takacs, Adam, *Deriving a parton shower for jet thermalization in QCD plasmas* (2025), [arXiv:2510.25837](#)
4. Roch, H. et al., *Transport-based initial conditions for heavy-ion collisions at finite densities* (2025), [arXiv:2510.06996](#)
5. Sirimanna, Chathuranga et al., *Interplay of prompt and non-prompt photons in photon-triggered jet observables*, *EPJ Web Conf.* **339**, 05002 (2025)
6. Roch, Hendrik et al., *Effects of hadronic reinteraction on jet fragmentation from small to large systems*, *EPJ Web Conf.* **339**, 02017 (2025)
7. Souidi, Ismail, *Jets: Hard-soft correlation - Theory overview*, *EPJ Web Conf.* **339**, 01002 (2025)
8. Souidi, Ismail, *Medium-induced parton splitting in expanding QCD matter* (2024), [arXiv:2409.04806](#)
9. Souidi, Ismail, Majumder, Abhijit, *Studying high  $p_T$  momentum azimuthal anisotropies in unpolarized proton-proton collisions using transverse momentum dependent (TMD) parton distribution and fragmentation functions*, *PoS SPIN2023*, 164 (2024)
10. Cao et al., *Jet quenching: From theory to simulation*, *Int. J. Mod. Phys. E* **33**, 2430002 (2024)
11. Souidi, Ismail, Majumder, Abhijit, *Azimuthal anisotropies at high- $p_T$  from transverse momentum dependent (TMD) parton distribution and fragmentation functions*, *EPJ Web Conf.* **296**, 13015 (2024)
12. Souidi, Ismail, Majumder, Abhijit, *Azimuthal anisotropy at high transverse momentum in p-p and p-A collisions*, *Phys. Lett. B* **859**, 139105 (2024)
13. Weber et al., *Computing jet transport coefficients on the lattice*, *PoS HardProbes2023*, 180 (2023)
14. Arslanok, M. et al., *Hot QCD White Paper* (2023), [arXiv:2303.17254](#)
15. Sirimanna et al., *Quenching jets increases their flavor*, *Phys. Rev. C* **108**, 014911 (2023)
16. Mehtar-Tani et al., *Jet thermalization in QCD kinetic theory*, *JHEP* **05**, 091 (2023)
17. Schlichting, S., *Non-perturbative Determination of the Collisional Broadening Kernel and Medium-induced Radiation in QCD Plasmas*, *Acta Phys. Polon. Supp.* **16**, 1–A121 (2023)
18. Moore et al., *Non-perturbative phenomena in jet modification*, *EPJ Web Conf.* **258**, 05001 (2022)
19. Souidi, Ismail, *Energy loss and equilibration of a highly energetic parton in QCD plasmas* (2021)
20. Moore et al., *Non-perturbative determination of collisional broadening and medium induced radiation in QCD plasmas*, *JHEP* **10**, 059 (2021)
21. Schlichting, Soeren, Souidi, Ismail, *Energy loss and equilibration of jets in a QCD plasma.*, *PoS HardProbes2020*, 137 (2021)
22. Schlichting, Soeren, Souidi, Ismail, *Medium-induced fragmentation and equilibration of highly energetic partons*, *JHEP* **07**, 077 (2021)
23. Souidi et al., *Polarization of gravitational waves in symmetric teleparallel theories of gravity and their modifications*, *Phys. Rev. D* **100**, 044008 (2019)

**JETSCAPE Collaboration (co-author, 14)**

1. Ehlers, R. et al., *Bayesian inference analysis of jet quenching using inclusive jet and hadron suppression measurements*, [Phys. Rev. C \*\*111\*\*, 054913](#) (2025)
2. Tachibana, Y. et al., *Enhanced signal of momentum broadening in hard splittings for  $\gamma$ -tagged jets in a multistage approach* (2025), [arXiv:2503.23693](#)
3. Sengupta, A. et al., *Hybrid Hadronization – A Study of In-Medium Hadronization of Jets* (2025), [arXiv:2501.16482](#)
4. Sirimanna, C. et al., *Hard-photon-triggered jets in p-p and A-A collisions*, [Phys. Rev. C \*\*111\*\*, 064911](#) (2025)
5. Sirimanna, Chathuranga et al., *Photon-triggered jets as probes of multi-stage jet modification*, [EPJ Web Conf. \*\*296\*\*, 11008](#) (2024)
6. Ehlers, Raymond et al., *Measuring jet quenching with a Bayesian inference analysis of hadron and jet data by JETSCAPE*, [EPJ Web Conf. \*\*296\*\*, 15009](#) (2024)
7. Mankolli, Andi et al., *3D multi-system Bayesian calibration with energy conservation to study rapidity-dependent dynamics of nuclear collisions*, [EPJ Web Conf. \*\*296\*\*, 05010](#) (2024)
8. Angerami, Aaron et al., *Hybrid Hadronization of Jet Showers from  $e^+e^-$  to  $A + A$  with JETSCAPE*, [PoS HardProbes2023, 166](#) (2024)
9. Jetscape et al., *A multistage framework for studying the evolution of jets and high- $p_T$  probes in small collision systems*, [PoS HardProbes2023, 128](#) (2024)
10. Jetscape et al., *Multiscale evolution of heavy flavor in the QGP*, [PoS HardProbes2023, 100](#) (2024)
11. Fan, W. et al., *New metric improving Bayesian calibration of a multistage approach studying hadron and inclusive jet suppression*, [Phys. Rev. C \*\*109\*\*, 064903](#) (2024)
12. Jetscape et al., *Effects of multi-scale jet-medium interactions on jet substructures*, [PoS HardProbes2023, 165](#) (2024)
13. Tachibana, Y. et al., *Hard jet substructure in a multistage approach*, [Phys. Rev. C \*\*110\*\*, 044907](#) (2024)
14. Fan, W. et al., *Multiscale evolution of charmed particles in a nuclear medium*, [Phys. Rev. C \*\*107\*\*, 054901](#) (2023)

Full list: [inspirehep.net/authors/1813544](https://inspirehep.net/authors/1813544)