LUCA TEODORI

Curriculum Vitae

Department of Physics and Astrophysics
Weizmann Institute of Science, Rehovot (Israel)
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My Webpage
Github *Skype*

Summary

I am a PhD student in theoretical astrophysics. My main interest involve gravitational lensing and how we can use it to uncover the nature of dark matter and the structure of galaxies. I am also interested in cosmology (large scale structures, early universe) and dark matter. I mainly worked in degeneracies in strong gravitational lensing, and on the Ultralight dark matter model. Various codes (mostly in C++ and python) I used/developed for my projects can be found on my github page, `https://github.com/lucateo`

Education

2021- PhD student in Weizmann Institute, under the supervision of Prof. Kfir Blum (expected end: June 2025).

Publications

Journal Articles

An updated list of my publications can be also found in https://inspirehep.net/authors/1865293

2409.04134 **Kfir Blum and Luca Teodori**, *"AxionH0graphy: hunting for ultralight dark matter with cosmographic H_0 bias"*, published in:.

2305.19151 **Luca Teodori and Kfir Blum**, *"Host group degeneracy in gravitational lensing time delay determination of H_0"*, published in: JCAP 08 (2023) 065.

2201.05111 **Luca Teodori, Kfir Blum, Emanuele Castorina, Marko Simonović and Yotam Soreq**, *"Comments on the mass sheet degeneracy in cosmography analyses"*, published in: JCAP 07 (2022) 07, 027.

2106.05976 **Simon Birrer, Anowar J. Shajib et al**, *"lenstronomy II: A gravitational lensing software ecosystem"*, published in: J.Open Source Softw. 6 (2021) 62, 3283, J.Open Source Softw. 6 (2021) 3283.

2105.10873 **Kfir Blum and Luca Teodori**, *"Gravitational lensing H0 tension from ultralight axion galactic cores"*, published in: Phys.Rev.D 104 (2021) 12, 123011.

Workshop/Conferences participation

May 2024 **Workshop on strong gravitational lensing beyond the main lens**, Montpellier.
Participation as a speaker

March 2024 **Dark Matter Beyond the Weak Scale II**, Durham.
Participation as a speaker

November 2023 **IFPU workshop**, Trieste.
Participation and short talk in the workshop "New Physics from Galaxy Clustering II"

April 2023 **IPS conference**, Tel Aviv.
Participation in the 2023 Israel Physics Society conference.

February 2022 **IPS conference**, Be'er Sheva.
Participation to the 2022 Israel Physics Society conference.

Visiting

Jan/Feb 2024 **Visiting Perimeter Institute**, Waterloo.
Visit to Perimeter Institute, host: Prof. Sergey Sibiryakov.

December 2023 **Visiting Milano University**, Milano.
Visit to Milano University, host: Prof. Emanuele Castorina.

October 2023 **Visiting ICTP**, Trieste.
Visit to ICTP, host: Prof. Giovanni Villadoro.

June 2022 **Visiting CERN**, Geneva.
Visit to CERN, host: Dr. Marko Simonović.

October 2021 **Visiting Pisa University** , Pisa.
Visit to Pisa University, host: Prof. Paolo Panci.

Aug-Dec 2020 **DESY**, Hamburg.
Actual start of the PhD in DESY Hamburg, thanks to my affiliation to the Multimessenger Astronomy School. Supervision of Prof. Kfir Blum. Host: Prof. Rafael Porto.

Participation to schools

June 2023 **Summer School on Particle Physics**, Trieste.
Participation in the ICTP Summer School on Particle Physics 2023.

November 2022 **XXXIII Canary Islands Winter School of Astrophysics**, La Laguna.
Participation and short talk in the XXXIII Canary Islands Winter School of Astrophysics: Overlaps at the Frontiers of Astrophysics, Cosmology and Particle Physics.

July 2022 **Cargese 2022 Summer School**, Cargese.
Participation and short talk in the Cargese 2022 International Summer School: Rethinking Beyond the Standard Model.

September 2019 **Heraeus Summer school**, *Friedrich-Schiller-Universität*, Jena.
Participation and talk in the 2019 Heraeus Summer school on gravitational lensing.

Prizes

February 2024 **Chaim Mida travel prize**, *Prize for outstanding students in theoretical physics*, Weizmann Institute.

Talks/Seminars

August 2024 **AsCos IV**, *"Addressing the Mass Sheet Degeneracy in Gravitational Lensing Measurements of the Hubble Constant"*, Rehovot, Israel.

June 2024 **SISSA**, *"Degeneracies in time-delay cosmography"*, Trieste.

June 2024 **Milano University**, *"Degeneracies in time-delay cosmography"*, Milano.

May 2024 **Montpellier workshop**, *"Degeneracies in time-delay cosmography"*, Montpellier.

May 2024 **BGU seminar**, *"Fuzzy dark matter and the Hubble constant strong gravitational lensing measurement"*, Be'er Sheva, Israel.

April 2024 **IPS conference**, *"Comments on the mass sheet degeneracy in cosmography analyses"*, Tel Aviv, Israel.

April 2024 **Università di Padova**, *"Degeneracies in cosmography analyses"*, Padova University, Padova, Cosmology group seminar.

March 2024 **Durham workshop**, *"Fuzzy dark matter solitons in gravitational lensing time delays and the H_0 measurement"*, Durham, UK.

February 2024 **Perimeter Institute**, *"Fuzzy dark matter and the H_0 gravitational lensing measurement"*, Perimeter Institute, Canada, Particle physics seminar.

November 2023 **IFPU workshop**, *"Degeneracies in Hubble constant measurements using gravitational lensing"*, IFPU, Italy.

June 2023 **MMS annual meeting**, *"Degeneracies in cosmography analyses"*, Weizmann Insitute, Israel.
Multimessenger astronomy school 2023 annual meeting

April 2022 **IPS conference**, *"Comments on the mass sheet degeneracy in cosmography analyses"*, Ben-Gurion University, Israel.

February 2022 **Astro coffee**, *"Comments on the mass sheet degeneracy in cosmography analyses"*, Weizmann Insitute, Israel, Astrophysics seminar.

October 2021 **Pisa HEP-ph seminar**, *"The Mass-Sheet Degeneracy in Strong Gravitational Lensing"*, Pisa University, Italy.

June 2021 **TAU seminar**, *"Gravitational lensing H_0 tension from ultralight axion galactic cores"*, Tel Aviv University, Israel, HEP-ph seminar.

February 2021 **Falafel seminar**, *"Ultralight dark matter and the quasar lensing H_0 tension"*, Weizmann Insitute, Israel, HEP-ph seminar.

Poster sessions

April 2023 **IPS conference**, *"Host cluster degeneracy in gravitational lensing time-delay determination of H_0"*, Expo Tel Aviv, Israel.

June 2022 **MMS annual meeting**, *"Strong gravitational lensing: challenges for the H_0 inference"*, DESY Zeuthen, Germany.
MultiMessenger astronomy School 2022 annual meeting poster session

Journal clubs

June 2023 **MMS journal club**, *"Astrophysical background of gravitational waves"*.
Journal club held together with Loris Amalberti

June 2023 **Falafel seminar**, *"Dark matter substructures and strong gravitational lensing flux anomalies"*, Weizmann Insitute, Israel.

April 2023 **Student Astro coffee**, *"JWST possible detection of high mass and high redshift galaxies"*, Weizmann Insitute, Israel.

January 2023 **Astro coffee**, *"TDCOSMO XII: a new lensing H_0 measurement"*, Weizmann Insitute, Israel.

July 2022 **MMS journal club**, *"Cosmological background of gravitational waves"*.
Journal club held together with Mahmoud Al-Awashra

Educational qualifications

October 2019 **Master Degree in physics**, *Università degli studi*, Padova, 110/110 cum laude.
Thesis Title: "Non-linear evolution of cosmological power-spectra using the Kinetic Field Theory approach"
Supervisor: Matarrese Sabino
Co-supervisor: Bartelmann Matthias

September 2017 **Bachelor degree in physics**, *Università degli studi*, Pavia, 110/110.
Thesis Title: "A common framework for entropy in thermodynamics and quantum information theory"
Supervisor: Perinotti Paolo

Computer skills

Systems **Unix/Linux, Windows**.
Discrete knowledge of the bash environment.

Languages **C++, Python, PyTorch, LaTeX, html**.
Good knowledge of the C++ and python languages. Various C++ and python projects can be found on my github page, `https://github.com/lucateo` whereas my site (hosted on github servers) is in `https://lucateo.github.io/`

Teaching Assistantship

2024 **Quantum Field Theory**, *Weizmann Institute*, master course.

2023/2024 **Cosmology 2**, *Weizmann Institute*, PhD course.

2022/2023 **Quantum mechanics 1**, *Weizmann Institute*, master course.

2016/2017 **Tutor in geometry and linear algebra**, *Alessandro Volta College, Pavia*, bachelor course.