Elena Hernández Martínez

hernandez@usm.lmu.de
elena-hernández-martínez-914209181
January 27th 1997
www.usm.uni-muenchen.de/ hernandez/
SPA, GER, EN, FR, BSK
+34 629127313
Scheinerstr. 1
81679 Munich, GER

Education

2022–now
Munich, Germany

Astrophysics, PhD, Ludwig-Maximilians-Universität

Thesis: Cosmology with Constrained Local Universe Simulations.
Supervisor: Prof. Dr. Klaus Dolag

2019–2021
Munich, Germany

Physics, M.Sc., Ludwig-Maximilians-Universität

1.3 (GPA: 4.0)
Thesis: Protoclusters of Galaxies in Cosmological Zoom Simulations;
Supervisor: Prof. Dr. Klaus Dolag
Grant: DAAD Scholarship for Master Studies 2020

2015–2019
Bilbao, Spain

Physik, B.Sc., Bask Country University (UPV/EHU)

8.75 (GPA: 3.0)
Thesis: In-device molecular spectroscopy in organic semiconductors and its applicarions in nanodevices [9.5 (GPA 4.0)];
Supervisor: Ikerbasque Dr. Luis Hueso Arroyo, CIC Nanogune
Recognition: TALENTIA nomination for excellence, Council of Vizcaya, 2019

2015
Bilbao, Spain

Highschool Diploma, German School of Bilbao (DSB)

1.1 (GPA: 4.0)
Majors: Physics and English
Recognition: Special Mention in Physics, German Physics Association (DPG)

Conferences and Workshops Selection

April 2024 **Columbia Cosmology Meeting**, New York, *USA*, invited speaker

April 2024 **Princeton Cosmology Meeting**, New Jersey, *USA*, invited speaker

March 2024 **Flatiron CCA - Cosmology Meeting**, New York, *USA*, invited speaker

July 2023 **CLUES Collab. Meeting** , Munich, *GER*, invited speaker

July 2023 **Hydrosims Workshop** , Sessto, *IT*, invited speaker

November 2022 **Flatiron CCA - CAMELS Workshop**, New York, *USA*, invited speaker

September 2022 **Hydrosims Workshop**, Trieste, *IT*, invited speaker

September 2022 **Tensions in Cosmology**, Corfu, *GR*, attendance

July 2022 **CLUES Collab. Meeting**, Madrid, *ES*, invited speaker

June 2022 **LOCALIZATION Collab. Meeting**, Paris, *FR*, invited speaker

December 2021 **Galaxy Clusters Across Cosmic Time, Winter School**, Tenerife, *ES*, poster

June 2021 **Protoclusters in Confinement**, Remote, attendance

May 2021 **DAAD Scholarship Holders Meeting**, Remote, invited speaker

Teaching

2023 **Software development**, Conquer Blocks

Development of a comprehensive Software Development course utilizing Python, currently integrated into the curriculum for Conquer Blocks' Machine Learning and Full-Stack Development master programs.
As of 2023, the Python Course has generated a net market value of $120,000 and has reached a total of 3,157 students.

2022 **Bachelor Thesis**, Student: Hannah Grewe

Supervisor

Work experience

2023
Remote (Dubai)

MM Strategist

Conquer X, Market Making Modelling

Creation and implementation of Delta and Gamma Neutral Market Making strategies in the context of decentralized finance.

February 2022–April 2022
Aizarnazabal, Spain

CFD Short-Term Researcher

Wavegarden Company, Computational Fluid Dynamics Team

Adaptation of existing wave production technologies from huge facilities to smaller facilities, opening the possibility of installing wave pools in comercial halls , airports and buildings all over the world.

June 2020–September 2020
San Sebastian, Spain

Summer Intern

CIC Nanogune, Nanodevices Research Group

Task: Optimization of superconduction in Graphene based nanodevices

- Organic polymers syntetization and deposition on lithographed substrates
- Characterization by Microscopy of Atomic Forces (AMF).
- Fermi Energy Tuning in Graphene

Skills

Programming skills

software development	Python, Fortran95, C/C++, IDL
HPC	MPI, OpenMPI
Astrophysics Software	OpenGadget3, Simba, Arepo
CFD Software	XFlow, DualPhysics, OpenFoam
Machine Learning	Pytorch, Optuna, Weights&Bias
Miscellaneous	Subfind, Pytorch, Solidworks
Front-end Development	CSS, HTML, BootStrap

Languages

Spanish	Native
German	Proficiency C2, Goethe Inst., 2014
English	Proficiency C2, U. Cambridge, 2014
Bask	Proficient
Italian	Intermediate
Portuguese	Intermediate
French	Basic

Publications

2022 **Robust field-level inference with dark matter halos**, Helen Shao, Francisco Villaescusa-Navarro, Pablo Villanueva-Domingo, Romain Teyssier, Lehman H. Garrison, Marco Gatti, Derek Inman, Yueying Ni, Ulrich P. Steinwandel, Mihir Kulkarni, Eli Visbal, Greg L. Bryan, Daniel Angles-Alcazar, Tiago Castro, **Elena Hernandez-Martinez**, Klaus Dolag, arXiv:2209.06843

Contributions: Run of half of the Magneticum cosmological boxes used in the study.

2023 **Simulating the Local Web (SLOW): I. Anomalies in the local density field**, Dolag, K., Sorce, J., Pilipenko, S., **Hernández-Martínez, E.**, Valentini, M., Gottlöber, S., Aghanim, N., Khabibullin, I., arXiv:2302.10960

Contributions: Co-Investigator in the computer time proposal (PI: Klaus Dolag). Data production for the proposal. Testing of the simulation during running period. Release of the SLOW simulations. Identification of Local Structures and their general properties.

2023 **Robust field-level likelihood-free inference with galaxies**, Natalí S. M. de Santi, Helen Shao, Francisco Villaescusa-Navarro, L. Raul Abramo, Romain Teyssier, Pablo Villanueva-Domingo, Yueying Ni, Daniel Anglés-Alcázar, Shy Genel, **Elena Hernandez-Martinez**, Ulrich P. Steinwandel, Christopher C. Lovell, Klaus Dolag, Tiago Castro, Mark Vogelsberger

Contributions: Paragraph on the Magneticum model and its subgrid physics. Run of half of the Magneticum cosmological boxes used in the study.

2023 **Cosmology with one galaxy? – The ASTRID model and robustness**, Nicolas Echeverri, Francisco Villaescusa-Navarro, Chaitanya Chawak, Yueying Ni, ChangHoon Hahn, **Elena Hernandez-Martinez**, Romain Teyssier, Daniel Angles-Alcazar, Klaus Dolag, Tiago Castro

Contributions: Run of half of the Magneticum cosmological boxes used in the study. Comments on the paper.

2023 **A universal equation to predict Ω_M from halo and galaxy catalogues**, Helen Shao, Natalí S.M de Santi, Francisco Villaescusa-Navarro, Romain Teyssier, Yueying Ni, Daniel Angles-Alcazar, Shy Genel, Lars Hernquist, Ulrich P. Steinwandel, Tiago Castro, **Elena Hernandez-Martınez**, Klaus Dolag, Christopher C. Lovell, Eli Visbal, Lehman H. Garrison, Mihir Kulkarni

Contributions: Run of half of the Magneticum cosmological boxes used in the study. Comments on the paper.

2024 **Simulating the Local Web (SLOW): II. Properties of Local Galaxy Clusters**, **E. Hernández-Martínez**, K. Dolag, J. G. Sorce, N. Aghanim, S. Pilipenko, S. Gottloeber, T. Lebeau, M. Valentini

2024 **Simulating the LOcal Web (SLOW) - *III*: Radio Halos in the Local Universe**, Dolag, K., Böss, L., Sorce, **Hernández-Martínez, E.**, J., Aghanim, N.

Contributions: Co-Investigator in the computer time proposal (PI: Klaus Dolag). Data production for the proposal. Testing of the simulation during running period. Release of the SLOW simulations. Identification of Local Structures and their general properties.

in prep. **Simulating the LOcal Web (SLOW) - *IV*: The Synchrotron Cosmic Web**, Böss, L., Dolag, K., Steinwandel, U., **Hernández-Martínez, E.**, Sorce, J., Aghanim, N.

Contributions: Co-Investigator in the computer time proposal (PI: Klaus Dolag). Data production for the proposal. Testing of the simulation during running period. Release of the SLOW simulations. Identification of Local Structures and their general properties.

in prep.

Simulating the LOcal Web (SLOW) - *V*: γ-Ray Emission in Local Clusters, Böss, L., Khabibullin, I., Dolag, K., Steinwandel, U., **Hernández-Martínez, E.**, Sorce, J., Aghanim, N.

Contributions: Co-Investigator in the computer time proposal (PI: Klaus Dolag). Data production for the proposal. Testing of the simulation during running period. Release of the SLOW simulations. Identification of Local Structures and their general properties.