

# Leila MIRZAGHOLI

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## EDUCATION

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SEP 2020	Ph.D. in THEORETICAL PHYSICS <b>Max Planck Institute for Astrophysics</b> , Garching, Germany Thesis: Chern-Simons Gravity and Fermions in Axion-SU(2) Gauge Field Models of Inflation Adviser: Prof. Dr. E. KOMATSU and Dr. K. D. LOZANOV
FEB 2016	M.Sc. in THEORETICAL PHYSICS Elite Master Program in Theoretical and Mathematical Physics <b>Ludwig-Maximilians University</b> , Munich, Germany Thesis: "Mimetic Dark Matter and its Modifications" Advisers: Prof. Dr. V. MUKHANOV and Dr. A. VIKMAN
JUNE 2011	M.Sc. in MATHEMATICS, MODULI SPACES <b>Mathematical Research Institute, Utrecht University</b> , Utrecht, The Netherlands Thesis: "Universal Quantum Manifolds" Adviser: Dr. L.L.H. WYLLEMAN
JUNE 2010	Bachelor of Science in PURE MATHEMATICS <b>University Of Tehran</b> , Tehran, Iran Thesis: "Applications of Group Theory in Theoretical Physics " Adviser: Prof. Dr. M.R. DARAFSHEH

## PROFESSIONAL EXPERIENCE

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2014 - 2015	Research Assistant: DATA ANALYSIS, IMAGE PROCESSING and PHOTOMETRY <b>University Observatory Munich (USM)</b> , Munich, Germany. Developed data analysis, and noise reduction on raw CCD images from <i>Serpens Cluster</i> . Performed photometry on different bands under supervision of Dr. Veronica Roccatagliata.
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## TEACHING AND ACADEMIC SERVICES

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2014 - 2016	Teaching Assistant <b>Ludwig-Maximilians University</b> , Munich, Germany. Held tutorials in <i>Quantum field theory in Curved Space-time</i> , <i>Cosmology</i> , <i>General Relativity</i> , (Prof. Dr. Slava Mukhanov), <i>Electrodynamics</i> , (Prof. Dr. Stefan Hoffmann) and <i>Mathematics for Physicists I, II, III</i> (Prof. Dr. Detlef Dürr).
2018 - Now	Reviewing Reviewing for the Journal of Cosmology and Astroparticle Physics (JCAP).

## PUBLICATIONS

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### First author Publications

1. Effects of Gravitational Chern-Simons during Axion-SU(2) Inflation  
**L. Mirzaghali**, E. Komatsu, Kaloian D. Lozanov and Yuki Watanabe  
Accepted in *Journal of Cosmology and Astroparticle Physics*. DOI: [10.1088/1475-7516/2020/06/024](https://doi.org/10.1088/1475-7516/2020/06/024),  
[arXiv: 2003.05931](https://arxiv.org/abs/2003.05931)
2. Production and Backreaction of Fermions from Axion-SU(2) Gauge Fields during Inflation  
**L. Mirzaghali**, A. Maleknejad and K. Lozanov  
Accepted in *PHYSICAL REVIEW D*. DOI: [10.1103/PhysRevD.101.083528](https://doi.org/10.1103/PhysRevD.101.083528),  
[arXiv: 1905.09258](https://arxiv.org/abs/1905.09258)
3. Imperfect Dark Matter  
**L. Mirzaghali** and A. Vikman  
Accepted in *Journal of Cosmology and Astroparticle Physics*. DOI: [10.1088/1475-7516/2015/06/028](https://doi.org/10.1088/1475-7516/2015/06/028),  
[arXiv: 1412.7136](https://arxiv.org/abs/1412.7136)

## PROJECTS

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### Clustering of Massive Neutrinos in the Vicinity of Earth

Using the [MAGNETICUM](#) simulation to calculate the density of massive neutrinos in the vicinity of Earth.

L. Blot, C. Carbone, K. Dolag, E. Komatsu, and **L. Mirzaghali**

## SKILLS

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PROGRAMMING    **Python, Mathematica.**  
Experience with **CLASS, CMBFAST, IRAF, and IDL.**

## SCIENTIFIC PRESENTATIONS

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### Talks by invitation

JUNE 2020    Effects of gravitational Chern-Simons term during axion-SU(2) inflation.  
*Zooming in on Axions in the Early Universe*,  
CERN, Switzerland.

### Talks by reviewed abstract

MAY 2020    Chiral Gravitational Waves from Inflation. *Institute Seminar*,  
Max Planck Institute for Astrophysics, Germany.

OCTOBER 2019    Gravitational Waves from the Early Universe. *IMPRS Symposium*,  
Max Planck Institute for Extraterrestrial Physics, Germany.

SEPTEMBER 2019    Production and Backreaction of Fermions from Axion-SU(2) Gauge Fields.  
*The Non-Gaussian Universe Workshop*, University of Cambridge, UK.

APRIL 2017    Overdensity of Cosmic Neutrinos Around Earth. *IMPRS Symposium*,  
Max Planck Institute for Extraterrestrial Physics, Germany.

JUNE 2016    Imperfect Dark Matter. *Utrecht Cosmology Symposium*, Utrecht University,  
The Netherlands.

### Posters

DECEMBER 2019    Parity violating during inflation.  
*B-mode from Space*, Max Planck Institute for Astrophysics, Germany.

SEPTEMBER 2019    Production and Backreaction of Fermions from Axion-SU(2) Gauge Fields.  
*COSMO19*, RWTH Aachen University, Germany.

## HONOURS AND AWARDS

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2014 - Now    Member of Elite Network of Bavaria.  
SEPTEMBER 2010    Mathematical Research Institute Scholarship, Utrecht University.  
JULY 2004    First Prize of Young Researchers, Center of Science and Astronomy, Tehran.

## NON-RESEARCH ACTIVITIES

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2019 - Now    Co-organiser of the Women's Encouragement Group at Max Planck  
Institute for Astrophysics.  
MARCH 2018    Talk at the annual Girls Day at the Max Planck Institute for Astrophysics.  
OCTOBER 2017    Observatory tour guide at the annual Open Day at the Max Planck  
Institute for Astrophysics.

## REFERENCES

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Prof. Dr. Eiichiro Komatsu  
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Dr. Alexander Vikman  
Central European Institute for Cosmology and Fundamental Physics  
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