

Katarina (Dida) Markovič: *Curriculum Vitae*

CONTACT INFORMATION Institute of Cosmology and Gravitation (ICG) *E-mail:* dida.markovic@gmail.com
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INTERESTS SIMULATING SURVEY SYSTEMATICS, GALAXY CLUSTERING, WARM DARK MATTER

EXPERIMENTS **Euclid Consortium - ESA Euclid Space Telescope** **2007-present**
L2: Long-term Contributor status expected to be awarded by Summer 2018 as endorsed by the Euclid Consortium Board and Euclid Consortium Lead (contact: Bob Nichol - Euclid representative for the UK).
Inter-science-working-group (IST) - Galaxy Clustering Task Group co-lead, **2015-present**
Galaxy Clustering End-to-end (GC-E2E) Simulations Project convener, **2014-present**
Galaxy Clustering Working Group - Link to Simulations Work Package co-lead, **2016-17**

Dark Energy Survey **2013**
Weak Lensing Shear Data tester

EMPLOYMENT **Research Fellow** with Prof. Will Percival **2016-present**
at the Institute of Cosmology & Gravitation, University of Portsmouth, UK.
A senior postdoctoral position allowing independence to pursue my own research interests.

UK Space Agency Senior Research Associate with Prof. Will Percival **2014-2016**
at the Institute of Cosmology & Gravitation, University of Portsmouth, UK.
Developing the survey strategy and data analysis pipeline for Euclid.

Visiting Researcher with Prof. Sarah Bridle **2013-2014**
remotely at the School of Physics and Astronomy, University of Manchester, UK.
Testing Dark Energy Survey weak lensing data.

Transregio33 Postdoctoral Fellow with Prof. Jochen Weller **2012-2013**
at the University Observatory Munich, Ludwig-Maximillan University, DE.
Developing models of large-scale structure in a warm dark matter (WDM) cosmology.

EDUCATION **Ludwig-Maximillan University**, Munich, DE **2009-2013**
at the International Max Planck Research School on Astrophysics
Ph.D. in Astrophysics

Darwin College, University of Cambridge, Cambridge, UK **2008-2009**
Certificate of Advanced Study in Applied Mathematics (Part III of the Tripos),

University College London, University of London, UK **2004-2008**
Master in Science in Astrophysics (MSci Astrophysics),

HONOURS AND AWARDS *Annual STAR postdoc award* recognising exceptional contributions to the Euclid mission **2017**
Public Engagement Large Awards Scheme for Entropy (PI, £25000, STFC) **2015-2017**
R & D Grant for Entropy (€8000, Arcadi Île de France) **2016**
European Student Bursary (£4000, Cambridge European Trust) **2008-2009**
Brian Duff Memorial Prize in Physics: best fourth year project in the department **2008**
Summer Studentship (£2010, Royal Society) **2007**
Zois Scholarship for Gifted Students (approx. €25000, Slovenia) **2000-2010**

REFEREE FOR Physics Review D, Physics Review Letters, Monthly Notices of the Royal Astronomical Society.

PUBLICATIONS
WITH A
SIGNIFICANT
CONTRIBUTION

Markovič, et al. *Large-scale retrospective relative spectrophotometric self-calibration in space*. MNRAS, 467.3677M, May 2017, [arXiv:1606.07061](#).

This work proposed a better pattern of exposure tiling. The proposal was accepted by the EC and it resulted in changes in the Euclid baseline survey strategy.

Markovič & Viel. *Lya Forest and Cosmic Weak Lensing in a Warm Dark Matter Universe*. Review in PASA, 2014, vol. 31, e006, [arXiv:1311.5223](#).

Viel, **Markovič**, Baldi & Weller. *The Non-Linear Matter Power Spectrum in Warm Dark Matter Cosmologies*. MNRAS, 421...50V, March 2012, [arXiv:1107.4094](#).

This work presented the first fitting function to calculate 2-point statistics in the WDM universe, based on a suite of N-body simulations.

Smith & **Markovič**. *Testing the Warm Dark Matter Paradigm with Large-Scale Structures*. Phys. Rev. D, 84(6):063507, September 2011, [arXiv:1103.2134](#).

This work presented a way to account for diffuse dark matter in 2-point statistics resulting from WDM free-streaming for the first time.

Markovič, Bridle, Slosar & Weller. *Constraining Warm Dark Matter with Cosmic Shear Power Spectra*. JCAP01(2011)022, [arXiv:1009.0218](#).

This work showed that using Euclid weak lensing only, competitive constraints could be obtained on the mass of the dark matter particle.

CONFERENCE
PAPERS AND
OTHER
CONTRIBUTIONS

Rhodes, Nichol *et al*: *Scientific Synergy Between LSST and Euclid*. Oct 2017, accepted to ApJ, [arXiv:1710.08489](#).

Markovič: *Large Scale Structure of Warm Dark Matter*. PoS(Corfu2012)067, 2013, <http://pos.sissa.it>.

Amendola *et al* (Euclid Theory Group): *Cosmology and Fundamental Physics with the Euclid Satellite*. Living Rev.Rel. 16 (2013) 6, 224 pp, 2012, [arXiv:1206.1225](#).

Abbott *et al*. (The DES Collaboration): *First SN Discoveries from the Dark Energy Survey*. 2012ATel.4668....1A, 2012.

de Vega & Sanchez: *Warm Dark Matter in the Galaxies: Highlights and Conclusions of the Chalonge Meudon Workshop*. 2011, [arXiv:1109.3187](#).

TECHNICAL SKILLS

Programming languages: proficient in Python, Matlab, Octave, L^AT_EX,
some training C/C++, in Mathematica, Java, Visual Basic/Excell,
some experience with Bash, SQL, HTML, Fortran, IDL

Software tools and libraries: proficient with Git, Numpy,
some experience with Pandas, Scipy, Jupyter, Mercurial

Scientific codes experience: [CosmoSIS](#), [CLASS](#), [CAMB](#), [Gadget2](#), [N-GenIC](#), [nicaea](#)

Technical: some experience with electronic and manual telescope operation

SOFTWARE WITH A
SIGNIFICANT
CONTRIBUTION

Publicly available on github.com/didamarkovic or otherwise:

[ubercal](#) - a Python code to simulate the self-calibration from overlapping exposures in astronomical survey as described in Markovič, et al. (MNRAS, 467.3677M, 2017).

[metafil](#) - a small set of useful Python tools for filename and metadata generation.

[entropy](#) - full software written by the Entropy team in C++ that generates Entropy visuals requiring the input of astronomical and simulated datasets and making use of the [Open Frameworks](#) toolkit for creative coding.

[gcfish](#) - a Python code to calculate a Fisher matrix and make Dark Energy forecasts for a general galaxy survey, which includes an easily human-readable and pedagogical Jupyter notebook.

Euclid proprietary or private, required to be accessible only in internal software repositories:
[pypelid](#) - simulation pipeline that processes a catalogue of galaxy redshifts to add Euclid observational effects to it.

[Euclid/gcfish](#) - a validated code to calculate the Euclid galaxy clustering Fisher matrix.

[plfmat](#) - used in the Euclid IST group for validation of Fisher matrix codes.

COMMITTEES	Postdoc representative at the management committee, ICG, UK Equality and diversity committee (and Athena SWAN team), ICG, UK	2016-present 2015-16
SELECTED RECENT TALKS	Invited talk: <i>Galaxy Clustering Analysis with Euclid</i> , Cosmology with Large Galaxy Surveys School, NAOC, Beijing, China Plenary talk: <i>Euclid Postdoc STAR Prize talk</i> , Euclid Consortium meeting, UCL, London, UK Requested talk: <i>Pypelid - Euclidiser of catalogues</i> , Euclid ground segment top-level data group (OU-LE3) meeting, RAS, London, UK Requested talk: <i>Galaxy Clustering at Science Performance Verification</i> , Euclid Science Performance Verification (SPV) 2017 Kickoff Meeting, IAP, Paris, France Requested talk: <i>Euclid IST: a road to reliable forecasts</i> , Euclid UK Meeting, RAS, London, UK Requested talk: <i>Simulated Ubercal with Euclid-like 4-dither patterns</i> , Euclid Photometric Calibration Workshop, ESAC, Madrid, Spain Invited talk: <i>Simulated Ubercal with Euclid-like 4-dither patterns</i> , Euclid Photometric Calibration Workshop, ESAC, Madrid, Spain Talk: <i>Euclid Galaxy Clustering End-to-end</i> , National Astronomy Meeting, Nottingham, UK Talk: <i>Warm Dark Matter from the Large Scale Structure</i> , Astroparticle Physics 2014, Amsterdam, NL Talk: <i>Warm Dark Matter</i> , University of Munich Observatory Colloquium, Munich, DE	Aug 2017 June 2017 Feb 2017 Jan 2017 Dec 2016 Sep 2016 Sep 2016 June 2016 June 2014 May 2013
SELECTED RECENT SCIENCE COMMUNICATION	Talk: <i>Euclid: A Space Mission to Map the Dark Universe</i> , Space Lectures at the Winchester Science Centre , UK Five performances: <i>Entropy</i> - an immersive story about the life of our universe, TodaysArt Festival (NL), Euclid Meeting (UK), Sonar Festival (E) Co-lead: <i>Entropy</i> project for communicating science to the public through art, International art-science project: UK, BE, NL, FR, DE + CAN Talk: <i>Euclid: A Space Mission to Map the Dark Universe</i> , Stargazing Live , University of Portsmouth, UK Talk: <i>Entropy: Astronomy Staged as a Live Immersive Performance</i> , National Astronomy Meeting, Nottingham, UK Invited Talk: <i>Entropy: Astronomy Staged as a Live Immersive Performance</i> , Resonate Festival, Belgrade, SR Talk: <i>Sprehodi skozi vesolje: Vesoljska zgodba</i> , Šolski Center Krško-Sevnica, Krško, SI Talk: <i>Sprehodi skozi vesolje: Življenje našega vesolja</i> , Slovenian Museum of Natural History, Ljubljana, SI	May 2017 2016-present 2011-present Jan 2017 June 2016 Apr 2016 April 2016 May 2014
TEACHING	<i>Cosmology masters course tutor</i> , Ludwig Maximillian University, Munich, DE <i>Co-supervisor of a master student</i> , Ludwig Maximillian University, Munich, DE <i>Part-time astronomy demonstrator</i> , University of London Observatory, UK	2011-2013 2011-2012 2006-2008
LANGUAGES	Native level English & Slovenian, advanced German, basic Croatian & French.	
ACADEMIC REFERENCES	Will Percival, ICG Portsmouth, UK Bianca Garilli, INAF Milan, Italy Anne Ealet, CPPM Marseille, France Bob Nichol (Euclid UK rep), ICG Portsmouth, UK	