Yashar Akrami

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EDUCATION

PhD in Theoretical Physics (Cosmology and Astroparticle Physics) **June 23, 2011**
The Oskar Klein Centre for Cosmoparticle Physics, Department of Physics, Stockholm University, Sweden.
Thesis title: *Supersymmetry vis-à-vis observation: dark matter constraints, global fits and statistical issues.*

PhL (Fil. Lic.) in Theoretical Physics (Cosmology and Astroparticle Physics) **February 26, 2010**
The Oskar Klein Centre for Cosmoparticle Physics, Department of Physics, Stockholm University, Sweden.
Thesis title: *Weak-scale supersymmetry: parameter space, complexity and global fits.*

Masters in Physics (Cosmology) **January 18, 2006**
Department of Physics, Sharif University of Technology, Tehran, Iran.
Thesis title: *Primordial perturbations as an observational probe of inflation*; completed at the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India.

Bachelors in Electrical Engineering (Control and Telecommunication) **September 21, 2003**
Department of Electrical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran.

High school **September 21, 1998**
National Organization for Development of Exceptional Talents (NODET), Iran.

PROFESSIONAL EXPERIENCE

Junior Research Chair in Cosmology **October 1, 2018 - present**
International Center for Fundamental Physics (ICFP), École Normale Supérieure (ENS), Paris, France.
Awarded as the *2018 laureate* of the prestigious ENS-ICFP Junior Research Chair program - including funding for hiring PhD students.

Senior Postdoctoral Research Fellow in Cosmology **August 1, 2016 - July 31, 2018**
Lorentz Institute for Theoretical Physics, Leiden University, The Netherlands.

Postdoctoral Research Fellow in Cosmology **November 5, 2014 - July 31, 2016**
Institute for Theoretical Physics (ITP), Heidelberg University, Germany.
DFG-funded project TRR33 "The Dark Universe".

Postdoctoral Research Fellow in Cosmology **August 1, 2011 - November 4, 2014**
Institute of Theoretical Astrophysics, University of Oslo, Norway.
ERC-funded project "The Anisotropic Universe: A Reality or Fluke?".

SCIENTIFIC AND PROFESSIONAL DUTIES

– *Large-scale collaborations:*
- Member of the **LiteBIRD** Collaboration; 07.2019 - present
- Member of the ESA **Euclid** Consortium (active mainly in Theory Working Group); 01.2012 - present
- **Leader** of **Euclid** Work Package on *initial conditions*; 11.2018 - present
- Member of the **Square Kilometer Array (SKA)** Collaboration; 01.2015 - present
- LFI Core Team Member of the ESA **Planck** Collaboration; 06.2013 - present
- Member of the proposing team for **CMB-HD**; 01.2019 - present
- Member of the **Euclid** Consortium Diversity Committee (ECDC); 06.2018 - present
- Member of the **Aquila** Consortium for Bayesian Large-Scale Structure Inference; 10.2018 - present
- Member of the **European COST Action** "Cosmology and Astrophysics Network for Theoretical Advances and Training Actions (**CANTATA**)"; 08.2016 - present
- Affiliated member of the NASA **Fermi Large Area Telescope (LAT)**; 2008 - 2011

– *Member of the organizing committees for:*
- SKA Cosmology SWG Meeting; École Normale Supérieure, Paris, France, January 2020
- E_UN_GS: Early Universe from Next Generation of Surveys; École Normale Supérieure, Paris, France, Winter 2021
- GOLD: The Golden Cosmological Surveys Decade; Paris-Saclay, France, April-June 2020
- Paris Primordial Cosmology Meetings (3 per year); Paris, France, started in 2019
- 9th and 10th TRR33 Winter School on Cosmology; Passo del Tonale, Italy, December 2015 and 2016
- Tehran Conference on Modified Gravity; Tehran, Iran, January 2016
- Heidelberg-Geneva Workshop on Cosmology: Gravity at the Largest Scales; Heidelberg, Germany, October 2015
- ITP Local Interactions 2015: Gravity Beyond Einstein; Heidelberg, Germany, May 2015
- International Conference on Beyond ΛCDM; Oslo, Norway, January 2015
- Dark Matter Meeting; Oslo, Norway, October 2011
- OKC Workshop on Supersymmetry (PROSPECTS); Stockholm, Sweden, September 2010

– *Associate member of the Committee on Space Research (COSPAR); 2014 - present*
– *Organizer of Leiden Cosmology Seminars, 2016 - 2018, Leiden, The Netherlands*
– *Organizer of ITP Cosmology Seminars, 2015 - 2016, Heidelberg, Germany*

– *Other memberships:*
- Management Committee Member (representative of the Netherlands) for the European COST Action CANTATA; 2016 - 2018
- European Physical Society; 2010 - present
- Swedish Physical Society (2010 - 2014) and Swedish Association of University Teachers (2010-2012)

– *Referee for international journals:*
- Physical Review D
- Physical Review Letters
- Physics Letters B
- Journal of Cosmology and Astroparticle Physics (JCAP)
- Journal of High Energy Physics (JHEP)
- Monthly Notices of the Royal Astronomical Society
- Classical and Quantum Gravity (CQG)
- Physics of the Dark Universe
- Universe
- General Relativity and Gravitation (GERG)
- European Physical Journal C
- Reports on Progress in Physics
- European Journal of Physics
- Journal of Physics G
- Astrophysics and Space Science

ACADEMIC AND RESEARCH INTERESTS

- Multi-messenger cosmology: cosmological surveys (*Planck*, *LiteBIRD*, *Euclid*, *the SKA*, *CMB-HD*)
- Early-universe cosmology: cosmic microwave background (CMB), initial conditions, inflation and alternatives, primordial perturbations, primordial black holes, string cosmology
- Late-time universe: cosmic acceleration, dark energy, cosmological constant problem
- Cosmological tests of gravity: CMB, large-scale structure (ultra-large scales, nonlinear regime), gravitational waves
- Laboratory tests of gravity and dark energy
- Large-scale cosmic anomalies and observational tensions: model building and data analysis
- Theory and phenomenology of dark matter
- Physics beyond the Standard Model of particle physics: supersymmetry, supergravity
- Statistical inference and high-performance computing in cosmology
- Artificial intelligence in cosmology and fundamental physics

SELECTED RESEARCH VISITS

- *Lorentz Institute for Theoretical Physics, Leiden University*, **Netherlands** [**September 2019**]
- *Imperial College London*, **UK** [**May 2019**]
- *Queen Mary University of London*, **UK** [**May 2019**]
- *Institute of Cosmology and Gravitation - University of Portsmouth*, **UK** [**May 2019**]
- *King's College London*, **UK** [**May 2019**]
- *University of Nottingham*, **UK** [**April 2018**]
- *Institut de Physique Théorique, CEA Saclay, Paris*, **France** [**September 2017**]
- *Institute for Research in Fundamental Sciences (IPM)*, **Iran** [**November-December 2016 and August 2017**]
- *The Oskar Klein Centre for Cosmoparticle Physics, Stockholm University*, **Sweden** [**September 2016**]
- *University of Geneva*, **Switzerland** [**November 2015**]
- *Bielefeld University*, **Germany** [**July 2015**]
- *Nordic Institute for Theoretical Physics (NORDITA)*, **Sweden** [**March and August 2015**]
- *Lund University*, **Sweden** [**June 2015**]
- *DAMTP, University of Cambridge*, **UK** [**June 2014**]
- *ITP, Heidelberg University*, **Germany** [**May 2014**]
- *DAMTP, University of Cambridge*, **UK** [**April 2014**]
- *California Institute of Technology (Caltech) and NASA Jet Propulsion Laboratory (JPL)*, **USA** [**November and December 2013**]
- *Asia Pacific Center for Theoretical Physics (APCTP)*, **South Korea** [**June 2013**]
- *California Institute of Technology (Caltech) and NASA Jet Propulsion Laboratory (JPL)*, **USA** [**November and December 2012**]
- *University of Oxford*, **UK** [**April - June 2012**]
- *Inter-University Centre for Astronomy and Astrophysics (IUCAA)*, **India** [**Summer and Autumn 2005**]
- *Inter-University Centre for Astronomy and Astrophysics (IUCAA)*, **India** [**Summer and Autumn 2004**]

SELECTED SCHOOLS/CONFERENCES/MEETINGS (mainly as speaker/organizer except for early schools)

- **2019:**

– *B-mode from Space*, Max-Planck-Institut für Astrophysik, Garching, **Germany**
– *CoSyne: Cosmological synergies in the upcoming decade*, Institut d'Astrophysique de Paris (IAP), Paris, **France**
– *French Dark Energy Theory Meeting*, Institut Henri Poincaré, Paris, **France**
– *Aquila Consortium meeting*, Imperial College London, **UK**
– *ENS team-building meeting*, Roscoff, **France**
– *The Paris-Saclay AstroParticle Symposium 2019*, Institut Pascal, **France**
– *Paris-Amsterdam-London-Stockholm 9th meeting (PALS) 2019*, Sorbonne University, Paris, **France**
– *Understanding cosmological observations*, Benasque, **Spain**
– *Particle physics, String theory and Cosmology (PASCOS) 2019*, University of Manchester, **UK**
– *Gordon Research Conference (GRC) on String Theory and Cosmology: New Physics in the Era of Precision Cosmology*, Barcelona, **Spain**
– *Gordon Research Seminar (GRS) on String Theory and Cosmology: Accelerating Expansion and Cosmological Evolution in String Theory*, Barcelona, **Spain**
– *Inflation and Geometry*, Institut d'Astrophysique de Paris (IAP), Paris, **France**
– *Euclid Consortium Meeting 2019*, Helsinki, **Finland**
– *Planck NPIPE meeting*, Institut d'Astrophysique de Paris (IAP), Paris, **France**
– *Euclid Theory Working Group Meeting 2019*, University of Oxford, **UK**
– *Cosmology@Malta*, Fort St Elmo, Valletta, **Malta**

- **2018:**

– *SKA-France meeting*, École Normale Supérieure (ENS), Paris, **France**
– *Aquila Consortium meeting*, Institut d'Astrophysique de Paris (IAP), Paris, **France**
– *Machine Learning @IHP*, Institut Henri Poincaré, Paris, **France**
– *Analytics, Inference, and Computation in Cosmology*, Institut Henri Poincaré, Paris, **France**
– *The vacuum of the Universe 2018: from cosmology to particle physics – CMB Anomalies and Tensions*, Institute of Cosmos Sciences (ICCUB), Barcelona, **Spain**
– *Euclid Theory Working Group Meeting*, Institut Henri Poincaré, Paris, **France**
– *Euclid Theory Work Package I (Cosmic Acceleration and Tests of Gravity) Meeting*, University of Lisbon, **Portugal**
– *Physics@Veldhoven*, Veldhoven, **Netherlands**

- **2017:**

– *Square Kilometre Array (SKA) Cosmology Science Working Group meeting*, Queen Mary University of London, **UK**
– *2nd CANTATA Meeting*, Frankfurt Institute for Advanced Studies, **Germany**
– *Dark Energy in the Laboratory*, Leiden, **Netherlands**
– *Dark Energy and Modified-Gravity cosmologies: DARKMOD*, CEA Saclay, Paris, **France**
– *Tehran Meeting on Cosmology*, IPM, **Iran**
– *Advances in Theoretical Cosmology in Light of Data*, NORDITA, **Sweden**
– *Theoretical Approaches to Cosmic Acceleration: Connecting String, Supergravity and Quantum Field Theory Aspects of (Near-) De Sitter Space*, Leiden, **Netherlands**
– *Euclid Theory Working Group Meeting*, Heidelberg, **Germany**
– *Physics@Veldhoven*, Veldhoven, **Netherlands**

- **2016:**

– *10th TRR33 Winter School on Cosmology (as organizer)*, Passo del Tonale, **Italy**
– *1st CANTATA Meeting*, Lisbon, **Portugal**
– *8th Bethe Center Workshop: Particle Physics meets Cosmology*, Bad Honnef, **Germany**
– *SW10: Hot topics in Modern Cosmology*, Cargese, Corsica, **France**
– *Theoretical Cosmology in the Era of Large Surveys*, Galileo Galilei Institute, Florence, **Italy**

- **2015:**

– *9th TRR33 Winter School on Cosmology (as organizer)*, Passo del Tonale, **Italy**
– *Planck I&S and CP Meeting*, Torun, **Poland**
– *Workshop on Particles and Cosmology*, Corfu, **Greece**
– *Euclid Consortium Meeting 2015*, EPFL, **Switzerland**
– *Kosmologietag 10*, Bielefeld University, **Germany**
– *Extended Theories of Gravity*, NORDITA, **Sweden**
– *Beyond ΛCDM*, Oslo, **Norway**

- **2014:**

– *PLANCK 2014*, Ferrara, **Italy**
– *Dark Energy Interactions*, NORDITA, **Sweden**
– *Planck Joint LFI/HFI meetings*, Bologna, **Italy** and Paris, **France**
– *NBIA-APCTP Workshop on Cosmology*, Copenhagen, **Denmark**

– *COSPAR Scientific Assembly*, Moscow, **Russia**
– *Planck I&S Meeting*, Torun, **Poland**
– *Euclid Consortium Meeting*, Marseille, **France**
– *Structure of Gravity and Spacetime*, University of Oxford, **UK**

• **2013:**
– *COSMO 2013*, University of Cambridge, **UK**
– *Prospects of Studying Dark Energy*, Seoul, **South Korea**
– *IEU Cosmology Conference*, Seoul, **South Korea**
– *Euclid Consortium Meeting*, Leiden, **Netherlands**
– *The Universe as seen by Planck*, ESA/ESTEC, **Netherlands**
– *Cosmological Tests of Gravity*, University of Oxford, **UK**

• **2012:**
– *Modern Cosmology: Early Universe, CMB and LSS*, Benasque, **Spain**
– *Marcel Grossmann Meeting*, Stockholm, **Sweden**
– *Recontres Itzykson – Heart of Darkness: Dark Energy and Modified Gravity*, IPhT CEA-Saclay, **France**
– *Nordic-Baltic Summer School (as lecturer)*, Onsala, **Sweden**
– *Euclid Consortium Meeting*, Copenhagen, **Denmark**

• **2011:**
– *The Return of de Sitter*, NORDITA, **Sweden**
– *Global BSM Fits and LHC Data*, CERN, **Switzerland/France**

• **2010:**
– *Darkness Visible*, University of Cambridge, **UK**
– *Quarks, Strings and the Cosmos*, Stockholm, **Sweden**
– *Experimental Search for Quantum Gravity*, NORDITA, **Sweden**
– *TOOLS 2010*, Winchester, **UK**
– *Cosmic Ray Backgrounds in Dark Matter Searches*, Stockholm, **Sweden**

• **2009:**
– *TeV Particle Astrophysics V*, SLAC/Stanford, **USA**
– *Astroparticle Physics: A Pathfinder to New Physics*, NORDITA, **Sweden**

• **2008:**
– *Biennial Leopoldina Conference on Dark Energy*, Munich, **Germany**
– *Identification of Dark Matter*, Stockholm, **Sweden**
– *Summer School on de Sitter Cosmology*, NORDITA, **Sweden**
– *TeV Scale Physics and Dark Matter*, NORDITA, **Sweden**
– *Symmetries and Phases in Universe*, Munich, **Germany**
– *LHC and Beyond*, NORDITA, **Sweden**

• **2007:**
– *Dark Matter, from the Cosmos to the Laboratory*, SLAC/Stanford, **USA**
– *Cosmology, Strings, and Phenomenology*, Stockholm, **Sweden**
– *Winter School in Particle Physics and Cosmology*, Gausdal, **Norway**

• **2006:**
– *School on Inflation and String Cosmology*, Aurhus, **Denmark**

TEACHING EXPERIENCE

- **École Normale Supérieure (ENS) [Autumn/Winter 2019/2020]:** Cosmology.
- **École Normale Supérieure (ENS) [Autumn 2018]:** Topics in Cosmology.
- **Leiden University [Spring 2018]:** Topics in Theoretical Physics.
- **Heidelberg University [Spring/Summer 2016]:** General Relativity (Obertutor).
- **Heidelberg University [Autumn/Winter 2015]:** Quantum Field Theory.
- **Heidelberg University [Spring/Summer 2015]:** Advanced Cosmology.
- **Stockholm University [2008-2011]:**
  – General Relativity
  – Advanced Relativistic Quantum Field Theory
  – Relativistic Quantum Mechanics
  – Quantum Mechanics III
- **Sharif University of Technology [2004-2006]:**
  – Advanced Cosmology
  – Advanced Electrodynamics
  – Advanced Classical Mechanics
  – Physics Lab. I and II

- **Tehran Polytechnic [2002-2003]:** Electromagnetism, Analytical Mechanics, Electrical Measurements and Circuits Lab.
- **LION Summer School: Modern physics at all scales** (invited lecturer) [**July 2017**], Leiden University.
- **LION Summer School: Modern physics at all scales** (invited lecturer) [**July 2018**], Leiden University.
- **Cosmology Beyond the Standard Model** (14-hour intensive course; invited lecturer) [**December 2016**], Tehran, Iran.
- **Nordic-Baltic Summer School** (invited lecturer) [**Summer 2012**], Onsala, Sweden.

SUPERVISION EXPERIENCE

- PhD advisor: Nicolas Chartier; École Normale Supérieure, started in September 2019. Title: "Understanding cosmic origins from galaxy surveys with Likelihood-Free Inference". Co-supervisors: Benjamin Wandelt (IAP) and Nick Kaiser (ENS). Funding provided by ENS as part of starting grant for my JRC position.
- Primary supervisor (MSc): Anna Negro; Erasmus student at École Normale Supérieure from University of Padova, Italy, starting in February 2020. Co-supervisors: Joseph Silk (IAP), Sabino Matarrese (Padova) and Alvise Raccanelli (CERN).
- Supervisor (MSc): William Doumerg; École Normale Supérieure (ongoing).
- Supervisor (MSc): Senwen Deng; École Normale Supérieure (defended).
- Co-supervisor (MSc): Michalis Dagtzis; Leiden University (defended).
- Supervisor (MSc): Jamie Watson; Leiden University (defended).
- Co-supervisor (summer project): Roohi Dalal (from JPL/Caltech, US); Leiden University (finished).
- Supervision elements for Valeri Vardanyan's PhD; Leiden University (defended).
- Co-supervisor (MSc): Vida Saeidzadeh (defended), Andia Khosravi (defended), Fereshteh Majidi (defended), and Sara Hoseini's (defended); Alzahra University.
- De facto supervisor (PhD): Henrik Nersisyan; Heidelberg University (adviser: Luca Amendola) (defended).
- De facto supervisor (MSc): Marvin Lüben; Heidelberg University (defended).
- De facto supervisor (MSc): Supranta Sarma Boruah; Indian Institute of Technology, Kanpur (defended).
- Co-supervisor (MSc): Romina Fassihi; IPM, Tehran (defended).
- Supervision elements for Adam R. Solomon's PhD; University of Cambridge (adviser: John Barrow) (defended).

PRIZES, AWARDS AND HONOURS

- 2018 laureate of the prestigious ENS-ICFP Junior Research Chair (JRC) program
- 2019 Giuseppe & Vanna Cocconi and 2018 Gruber Cosmology Prizes (awarded to Planck team)
- Helge Axelsson Johnson Foundation Award, 2010
- German Research Foundation (DFG) funding - Project TRR33 The Dark Universe, 2014
- Recipient of the competitive HEAC PhD funding, 2006
- Winner of the International Physics and Mathematics Olympiads, country level, 1997/1998

COMPUTER SKILLS

• *Programming languages:* Fortran, C, Python • *Computational software:* Mathematica, Maple, MATLAB • *High performance and parallel computing:* MPI, OpenMP • *Cosmological codes and packages:* CAMB, CosmoMC, CLASS, HEALPix, Commander, EFTCAMB, EFTCosmoMC, CosmicFish, hi_class • *Extensive experience in working with supercomputers, computer clusters, and large data sets*

COURSES TAKEN DURING PHD

• General Relativity Theory with Cosmology • Cosmology and Astroparticle Physics • Relativistic Quantum Mechanics • Quantum Field Theory • Theory of Supersymmetry • Applications of Supersymmetry • String Theory • Grand Unified Theories • Statistical Methods in Physics • Statistical Physics • Radiation Processes in Astrophysics • High Energy Astrophysics • University Pedagogy.

PERSONAL INFORMATION

• *Language:* Persian (mother tongue), English (fluent), Norwegian (fair), Swedish (sufficient) • *Hobbies:* dancing, playing violin, music (classical, Persian traditional), fencing, traveling, hiking, reading (literature, philosophy, politics), movies.

REFERENCES

Prof. Andrei Linde, Stanford University, USA, +1 650 723-2687 and +1 650 494-6106, alinde@stanford.edu
Prof. Renata Kallosh, Stanford University, USA, +1 650 725-4736, kallosh@stanford.edu
Prof. Luca Amendola, ITP Heidelberg, Germany, +49 6221 54-9407, l.amendola@thphys.uni-heidelberg.de
Dr. Alessandra Silvestri, Instituut Lorentz, Leiden University, Netherlands, +31 71 5275540, silvestri@lorentz.leidenuniv.nl
Prof. Nicholas Kaiser, ENS, France, +33 (0)1 44 32 33 67, nick.kaiser@ens.fr
Prof. Anne-Christine Davis, DAMTP, University of Cambridge, UK, +44 1223 337878, acd@damtp.cam.ac.uk
Prof. David F. Mota, ITA Oslo, Norway, +47 22 85 75 81, d.f.mota@astro.uio.no
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Prof. Benjamin D. Wandelt, IAP, France, +33 (0)1 44 32 81 43, bwandelt@iap.fr
Prof. Edvard Mörtsell, OKC Stockholm, Sweden, +46 8 5537 8535, edvard@fysik.su.se
Prof. Ana Achúcarro, Instituut Lorentz, Leiden University, Netherlands, +31 71 5275518, achucar@lorentz.leidenuniv.nl
Prof. Hans Kristian K. Eriksen, ITA Oslo, Norway, +47 22 85 84 54, h.k.k.eriksen@astro.uio.no
Prof. Frode Kristian Hansen, ITA Oslo, Norway, +47 22 85 65 16, f.k.hansen@astro.uio.no