Mindaugas Karčiauskas

Curriculum Vitae

Dept. de Física Teórica y del Cosmos
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Education and Employment

2010–current **Post-Doc**, *Deptamento de Física Teórica y del Cosmos*, Universidad de Granada. Spain

2006–2010 **PhD**, *Lancaster University*, Cosmology and Astroparticle Physics.
PhD thesis: "Quantum Fluctuations of Vector Fields and the Primordial Curvature Perturbation in the Universe"
Supervisor: Dr. Konstantinos Dimopoulos

2003–2005 **MSc**, *Vilnius University*, Theoretical Physics and Astronomy.
Master thesis: "Dwarf Irregular Galaxy Leo A. Star Formation History"
Supervisor: Prof. Vladas Vansevičius

1999–2003 **BSc**, *Vilnius University*, Theoretical Physics and Astronomy.
Bachelor thesis: "Luminosity Function of Single Galaxies and Pour Groups"
Supervisor: Prof. Andrey G. Doroshkevich

Research Interests

Inflation, cosmological perturbation theory, δN formalism, statistical anisotropy, vector fields in cosmology, anisotropic universes, modified gravity.

Publications

[1] Karčiauskas, *The Primordial Curvature Perturbation from Vector Fields of General non-Abelian Groups*, arXiv:1104.3629 [astro-ph.CO]

[2] Karčiauskas, *The Primordial Curvature Perturbation in the Universe* and Quantum Fluctuations of Vector Fields, LAP Lambert Academic Publishing (2010), ISBN: 3838369815

[3] Karčiauskas, M., Lyth, D. H., *On the health of a vector field with $RA^2/6$ coupling to gravity*, JCAP **1011**, 023 (2010)

[4] Dimopoulos, K., Karčiauskas, M., Wagstaff, J.M., *Vector Curvaton without Instabilities*, Phys. Lett. B **683**, 298 (2010)

[5] Dimopoulos, K., Karčiauskas, M., Wagstaff, J.M., *Vector Curvaton with Varying Kinetic Function*, Phys. Rev. D **81**, 023522 (2010)

[6] Karčiauskas, M., Dimopoulos, K., Lyth, D.H., *Anisotropic non-Gaussianity from Vector Field Perturbations*, Phys. Rev. D **80**, 023509 (2009)

[7] Dimopoulos, K., Karčiauskas, M., Lyth, D. H., Rodriguez, Y., *Statistical Anisotropy of the Curvature Perturbation from Vector Field Perturbations*, JCAP, **05**, 013 (2009)

[8] Dimopoulos, K., Karčiauskas, M., *Non-minimally Coupled Vector Curvaton*, JHEP, **07**, 119 (2008)

[9] Karčiauskas, M., Kjær, K., *Light Curve Analysis of VW Hyi*, Nordic-Baltic Research School, 071 (2002). ISBN:9986-9332-4-2. Ed: Meistas, E.G., Solheim, J.E.

A List of Recent Talks and Posters

02–04/11/2011 **Talk** title: *"The Primordial Curvature Perturbation from General non-Abelian Vector Fields"*. III CPAN Days, Barcelona, Spain

29/08/2011–02/09/2011 **Talk** title: *"The Primordial Curvature Perturbation from General non-Abelian Vector Fields"*. ERE2011, Universidad Complutense Madrid, Spain

22–26/09/2011 **Poster** title: *"The Curvature Perturbation from General non-Abelian Vector Fields"*. COSMO 11, Porto, Portugal

24/06/2011 **Talk** title: "*The Curvature Perturbation from General non-Abelian Vector Fields*". Universidad Complutense Madrid, Spain

27/01/2011 **Talk** title: *"Inflation, Cosmological Perturbations and Vector Fields"*. Universidad de Granada, Granada, Spain

27/11/2010–01/12/2010 **Poster** title: *"The Curvature Perturbation from Vector Fields"*. II CPAN Days, Valencia, Spain

04/08/2010 **Talk** title: *"The Vector Curvaton"*. CERN, TH Division, Switzerland

11/04/2010 **Talk** title: *"The Statistically Anisotropic Curvature Perturbation from Vector Fields"*. Institute for Theoretical Physics, Heidelberg, Germany

04/04/2010 **Talk** title: *"The Statistically Anisotropic Curvature Perturbation from Vector Fields"*. Arnold Sommerfeld Center for Theoretical Physics, Munich, Germany

Schools and Visits

Long term visits

1/7/2010–30/9/2010 Marie Curie Fellowship, *CERN TH-Division*, Geneva, Switzerland

1/9/2002–5/6/2003 Exchange student, *Copenhagen University*, Copenhagen, Denmark

Summer schools

28/9/2009–1/10/2009 "Particle Astrophysics and Cosmology", *The Third School of EU Network "Universe Net"*, Bellaterra, Spain

22–26/09/2008 "Seeking Links Between Fundamental Physics and Cosmology", *The Second School of EU Network "Universe Net"*, Oxford, United Kingdom

30/6/2008–3/7/2008 "New Trends in Particle Physics and Cosmology", *Advanced Summer Institute at the University of Sheffield*, United Kingdom

24–29/09/2007 "The Origin of the Universe", *First Annual School of EU Network "UniverseNet"*, Mytilene, Greece

26/8/2007–7/9/2007 BUSSTEPP 2007, *37th British Universities Summer School in Theoretical Elementary Particle Physics*, University of York, York, United Kingdom

6–16/7/2004 "Background Microwave Radiation and Intracluster Cosmology", *International school of physics "Enrico Fermi"*, Varenna, Italy

15/6/2003–11/7/2003 "Observational Astronomy and Astrophysics", *Vatican Observatory Summer School*, Castel Gandolfo, Italy

11–25/8/2002 "Astrophysics of Interacting Stars", *Nordic Baltic Research Course*, Molėtai, Lithuania

Public Outreach Activities

Organization — In 2005 and 2006 I was in the organizing committee of the 3rd and 4th *Lithuanian Astronomy Olympiad For High School Students*.

Publication — Karčiauskas, M., Šablevičiūtė, I., *The Fate Of the Universe Is Still a Mystery*, Mokslas ir Gyvenimas, **12**, (2005)

Work Placement — summer/2005, *Lithuanian Museum of Ethnocosmology*. As a tourist guide I ran seminars on popular science topics, showed visitors the night sky through a telescope, gave talks on astronomy and lead "Questions and Answers" sessions.

Teaching

During my PhD I have been marking the following courseworks and ran some workshops on:

- Series, Matrix Algebra and Probability
- Waves and Optics
- Basic Physics Skills
- Complex Methods
- Vectors and Vector Algebra
- Oscillations and Waves

Awards and Grants

1/7/2010–30/9/2010 — Marie Curie Fellowship, *CERN TH-Division*, Geneva, Switzerland

05/05/2009 — William Ritchie Travel Fund

01/10/2006 — Bursary from the Lancaster University Physics Department

16/06/2004 — the IPS-UNESCO (ROSTE) short-term fellowship

19/05/2005 — included in the publication "Leaders of Tomorrow" on 150 the most talented students of Vilnius University graduating that year

Other

I have been refereeing papers in "Monthly Notices of the Royal Astronomical Society" and "General Relativity and Gravitation".

Referees

- **Dr. Konstantinos Dimopoulos**
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  Lancaster University
  Lancaster
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  United Kingdom

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- **Dr. Mar Bastero-Gil**
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  Facultad de Ciencias (Edificio Mecenas)
  Universidad de Granada
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  Spain

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- **Prof. David H. Lyth**
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