

Jan J. Ostrowski

CURRICULUM VITAE

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Higher education

- 2011
2016
Ph.D. in astronomy, *Nicolaus Copernicus University*, Toruń, Ph.D.
- 2004
2011
M.Sc. in astronomy, *Nicolaus Copernicus University*, Toruń, M.Sc.
three years break between 2008 and 2010

PhD thesis

- title *Mass function of galaxy clusters in inhomogeneous relativistic cosmology*
supervisor Boudewijn Roukema
thesis advisor Thomas Buchert

Master thesis

- title *On the relativistic topological acceleration effect*
supervisor Boudewijn Roukema

Post-doc positions

- 2016
2018
post-doc position, at: *Centre de Recherche Astrophysique de Lyon, École Normale Supérieure de Lyon, Lyon Institut des Origines.*

Faculty positions

- 2018
2020
adiunkt (Juniorprofessor, assistant professor), at: *National Centre for Nuclear Research, Warsaw, Poland.*

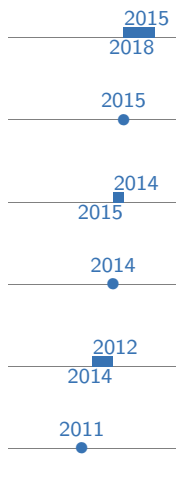
Teaching

- lab **Course in electro-dynamics** *Ecole Normale Supérieure de Lyon*
workshop **Introduction to Unix** *Nicolaus Copernicus University*
workshop **Structured programming** *Nicolaus Copernicus University*

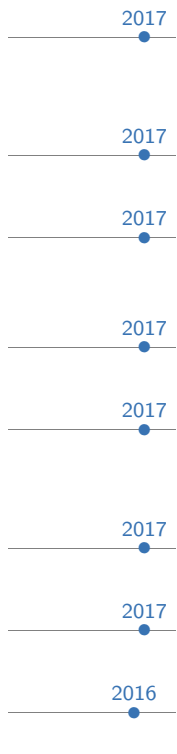
Memberships

- Polish Society on Relativity (POTOR)
- Cosmology group at Toruń Center for Astronomy (TCfA)
- Theoretical Cosmology Group at Centre de Recherche Astrophysique de Lyon

Grants/Scholarships

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- A vertical timeline on the left side of the section, with horizontal lines extending to the right. Blue dots mark the years 2011, 2012, 2014, 2015, and 2018. Blue bars above the lines indicate the duration of each grant or scholarship.
- 2015**
Polish National Science Centre grant: OPUS 9.
Project: relativistic corrections to the N -body simulations - team member
 - 2015**
High Energies, Compact Objects, and Large Surveys (HECOLS) grant.
scientific visit at the Centre de Recherche Astrophysique de Lyon
 - 2014**
Polish National Science Centre grant: Etiuda 2.
scientific visit at the Centre de Recherche Astrophysique de Lyon + doctoral scholarship
 - 2014**
High Energies, Compact Objects, and Large Surveys (HECOLS) grant.
scientific visit at the Centre de Recherche Astrophysique de Lyon
 - 2012**
Polish Ministry of Science grant: Mobilność plus II.
scientific visit at the Centre de Recherche Astrophysique de Lyon
 - 2011**
Nicolaus Copernicus University scholarship.
for scientific performance

Conferences and seminars

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- A vertical timeline on the left side of the section, with horizontal lines extending to the right. Blue dots mark the years 2016 and 2017. Blue bars above the lines indicate the duration of each event.
- 2017**
Cosmological backreaction conjecture: recent developments and future prospects.
seminar given at ERC funded ARTHUS meeting, Lyon (France)
 - 2017**
The Green-Wald conjecture and its aftermath .
seminar given at ERC funded ARTHUS meeting , Lyon (France)
 - 2017**
Cosmological mass function.
seminar given at University of Cape Town (Applied Mathematics Department) , Cape Town (RSA)
 - 2017**
Cosmological backreaction conjecture: recent developments .
4th conference of Polish Society on Relativity, Kazimierz Dolny (Poland)
 - 2017**
Cosmological backreaction conjecture: recent developments and future prospects.
44th Conference of Polish Physists, Wroclaw (Poland)
 - 2017**
Co-organizer.
Workshop: Inhomogeneous Cosmologies, Toruń (Poland)
 - 2017**
Relativistic mass function on cosmological scales.
Workshop: GR effects in cosmological surveys , Cape Town (RSA)
 - 2016**
The averaging problem in cosmology .
Seminar given at Laboratoire Astroparticule et Cosmologie (APC), Paris (France)

- 2016
The averaging problem in cosmology .
 Collider Physics, 2nd Symposium of the Division for Physics of Fundamental Interactions of the Polish Physical Society , Katowice (Poland)
- 2016
Is Green and Wald formalism applicable to the real Universe? .
 Invited talk at Jagiellonian University, Krakow (Poland)
- 2015
Is Green and Wald formalism applicable to the real Universe?.
 Invited talk at University of Szczecin, Szczecin (Poland)
- 2015
Is Green and Wald formalism applicable to the real Universe?.
 2nd conference of Polish Society on Relativity, Warsaw (Poland)
- 2015
Relativistic cosmology .
 Seminar given at Torun Centre for Astronomy (TCfA) , Torun (Poland)
- 2015
Relativistic Zel'dovich approximation and its applications.
 1st Roman Juskiewicz Symposium, Warsaw (Poland)
- 2015
On the Green and Wald formalism.
 14th Marcel Grossmann Meeting, Rome (Italy)
- 2015
Relativistic Zel'dovich approximation and averaging problem in cosmology.
 14th Marcel Grossmann Meeting, Rome (Italy)
- 2015
Relativistic Zel'dovich approximation.
 seminar given at Ludwig Maximilians Universität (LMU), Munich (Germany)
- 2014
On the Green-Wald formalism.
 Workshop: Fundamental Issues of the Standard Cosmological Model, Cargèse (France)
- 2014
On the relativistic analogue of the Zel'dovich approximation.
 1st conference of Polish Society on Relativity, Spała (Poland)
- 2014
Virialisation-induced curvature vs dark energy.
 seminar given at Laboratoire Univers et Théories (LUTH), Paris (France)
- 2014
On the Green and Wald formalism.
 seminar given at Ludwig Maximilians Universität (LMU), Munich (Germany)
- 2013
Virialisation-induced curvature vs dark energy.
 Hot Topics in General Relativity and Gravitation, Quy Nhon (Vietnam)

Scientific visits

- 2017
University of Cape Town, Cape Town, RSA.
 February and October; scientific collaboration
- 2016
Ludwig-Maximilians-Universität (LMU), Munich, Germany.
 two scientific visits
- 2016
Jagiellonian University, Krakow, Poland.
 scientific collaboration
- 2015
University of Szczecin, Szczecin, Poland.
 scientific collaboration
- 2013
Centre de Recherche Astrophysique de Lyon (CRAL), Lyon, France.
2015
 collaboration with GALPAC team

Languages

Polish **Native**
English **Fluent**
German **Basic**
French **Basic**

Skills

Physics *general relativity, cosmology, relativistic cosmology, Lagrangian perturbation theory, relativistic perturbation theory, ADM formalism in general relativity, weak-limit formalism in general relativity, Buchert formalism, observational cosmology, mass function statistics, modern cosmological data sets e.g. Sloan Digital Sky Survey (SDSS)*

Mathematics *Riemannian geometry, differential topology, functional analysis, Cartan formalism*

Computer skills *C, Fortran, bash, GNU Octave, GNU Maxima, Gnuplot, developing the GPL licensed code 'inhomog', Delaunay Tessellation Field Estimator (DTFE), Gadget 2 code*

Journal publications

2017

Roukema, B. F., P. Mourier, T. Buchert, and **Ostrowski, J. J.** “The background Friedmannian Hubble constant in relativistic inhomogeneous cosmology and the age of the Universe”. In: *Astronomy and Astrophysics* 598, A111, A111. arXiv: 1608.06004.

2016

Roukema, B. F., T. Buchert, H. Fujii, and **Ostrowski, J. J.** “Is the baryon acoustic oscillation peak a cosmological standard ruler?” In: *Mon. Not. R. Astron. Soc.* 456, pp. L45–L48. arXiv: 1506.05478.

2015

Buchert, T., M. Carfora, G. F. R. Ellis, E. W. Kolb, M. A. H. MacCallum, **Ostrowski, J. J.**, S. Räsänen, B. F. Roukema, L. Andersson, A. A. Coley, and D. L. Wiltshire. “Is there proof that backreaction of inhomogeneities is irrelevant in cosmology?” In: *Classical and Quantum Gravity* 32.21, 215021, p. 215021. arXiv: 1505.07800 [gr-qc].

2015

Roukema, B. F., T. Buchert, **Ostrowski, J. J.**, and M. J. France. “Evidence for an environment-dependent shift in the baryon acoustic oscillation peak”. In: *Mon. Not. R. Astron. Soc.* 448, pp. 1660–1673. arXiv: 1410.1687.

2013

Roukema, B. F., V. Blançoenil, and **Ostrowski, J. J.** “Topological implications of inhomogeneity”. In: *Phys. Rev. D* 87.4, 043521, p. 043521. arXiv: 1201.5845.

2013

Roukema, B. F., **Ostrowski, J. J.**, and T. Buchert. "Virialisation-induced curvature as a physical explanation for dark energy". In: *JCAP* 10, 043, p. 43. arXiv: 1303.4444 [astro-ph.CO].

2012

Ostrowski, J. J., B. F. Roukema, and Z. P. Buliński. "A relativistic model of the topological acceleration effect". In: *Classical and Quantum Gravity* 29.16, 165006, p. 165006. arXiv: 1109.1596 [astro-ph.CO].

Numerical code

2017

Roukema, B. F., **Ostrowski, J. J.**, and J. Borkowska. *inhomog: Biscale kinematical backreaction analytical evolution*. Astrophysics Source Code Library. ascl: 1711.002.

Conference proceedings

2017

Ostrowski, J. J., T. Buchert, and B. F. Roukema. "Mass Function of Galaxy Clusters in Relativistic Inhomogeneous Cosmology". In: vol. 10, p. 407. arXiv: 1703.04189.

2017

Roukema, B. F., **Ostrowski, J. J.**, T. Buchert, and P. Mourier. "Order-unity Argument for Structure-generated "Extra" Expansion". In: vol. 10, p. 403. arXiv: 1703.04191.

2016

Ostrowski, J. J., T. Buchert, and B. F. Roukema. "On the relativistic mass function and averaging in cosmology". In: arXiv: 1602.00302.

2015

Ostrowski, J. J. and B. F. Roukema. "On the Green and Wald formalism". In: arXiv: 1512.02947 [gr-qc].

2013

Ostrowski, J. J., B. F. Roukema, and T. Buchert. "Virialization-induced curvature versus dark energy". In: arXiv: 1311.5402 [astro-ph.CO].

Popular science article

2014

Ostrowski, J. J., T. A. Kazimierczak, and B. F. Roukema. *The dark side of the Universe: does dark energy really exist? (Polish Title: Ciemna strona Wszechświata: czy ciemna energia istnieje naprawdę?)* Vol. 85, pp. 8–12.