Rinat **Tagirov**

Research Associate

Imperial College London, Blacket Laboratory, Level 10, Astrophysics Group, Prince Consort Road, London SW7 2AZ, UK

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Education

ETH Zürich (Swiss Federal Institute of Technology Zürich)

Zürich, Switzerland

Doctor of Sciences

Sep. 2011 - Oct. 2016

- Thesis Title: Physical Understanding of Solar Irradiance in UV and Radio Wavelengths.
- Scientific Advisors: Dr. Alexander Shapiro, Prof. Dr. Werner Schmutz

Saint-Petersburg State University

Saint-Petersburg, Russia

Specialist Diploma in Astronomy

Sep. 2006 - Jun. 2011

- Thesis Title: Physical Conditions in Molecular Clouds at High Redshifts.
- Scientific Advisor: Dr. Alexandre Ivanchik

Skills

Science NLTE Radiative Transfer, Solar Irradiance Modeling

Programming Fortran, Python, Bash, LaTeX, IDL

Languages Russian, English, German (basic)

Experience

Imperial College London

London, UK

Research Associate

Oct. 2016 — PRESENT

- Developed NESSY for its implementation in 1.5D solar irradiance calculations, which included:
  - implementation of mixed NLTE/LTE calculations in NESSY;
  - merging the ATLAS9 code with the NLTE block of NESSY.

Physical-Meteorological Observatory Davos

Davos, Switzerland

PHD Student

Sep. 2011 — Sep. 2016

- Implemented accelerated Λ-iterations in the stellar radiative transfer code NESSY.
- Improved a method for derivation of CLVs of solar brightness from solar eclipse observations.
- Applied this method to PREMOS/PICARDS solar eclipse data.
- Compared the derived CLVs to the ones calculated with NESSY in order to test 1D models of solar atmosphere.
- Applied NESSY to calculate and analyze the facular and spot contrasts.
- Used these contrasts to model the solar irradiace in UV and radio and analyze the correlation between the two.

Ioffe Physical-Technical Institute

Saint-Petersburg, Russia

Internship

Sep. 2010 - Jun. 2011

- Improved a method for calculating particle concentration in molecular clouds at high redshifts.
- Using this method together with observations of carbon atom fine-structure lines:
  - calculated the CMB temperature in two molecular clouds associated with quasars J0812+3208 and Q1232+082;
  - calculated the hydrogen molecular fraction in these clouds.
- Estimated the UV radiation background and electron concentration in their inner parts.

Teaching

Faculty of Natural Sciences

Imperial College London

Year 1 Project Supervisor

Jan. 2017 — May 2017

- Was in charge of two first year students who worked as a pair.
- Their project was concerned with the identification of active regions (spots and faculae) on the solar surface.
- Images from HMI/SDO were analysed using Python image processing tools.

Department of Mechanical Engineering

ETH Zürich

Laboratory Practicum Assistant

Sep. 2013 — Dec. 2014

- Conducted the laboratory experiment practice instruction for about 25 students each semester.
- Marked the lab experiment reports.

Department of Physics *ETH Zürich*

Physics III Course Assistant *Sep. 2012 — Feb. 2013*

- Conducted excercise classes on optics, statistical mechanics and quantum mechanics for a group of about 20 students.
- Marked the excercise sheets.

Department of Physics *ETH Zürich*

Physics II Course Assistant *Jan. 2012 — May 2012*

- Conducted excercise classes on classical mechanics for a group of about 20 students.
- Marked the excercise sheets.
- Shared the role with one more assitant.

Publications

2017

- R. V. Tagirov, A. I. Shapiro and W. Schmutz
  NESSY: NLTE spectral synthesis code for solar and stellar atmospheres
  Astronomy & Astrophysics, 603, A27

- G. Thuillier, P. Zhu, A. I. Shapiro, S. Sofia, R. V. Tagirov, M. van Ruymbeke and W. Schmutz
  Solar disk radius determined from observations made during eclipses by bolometric and photometric instruments on-board the PICARD satellite
  Astronomy & Astrophysics, 603, A28

- J. Gröbner, S. Kazadzis, N. Kouremeti, L. Doppler, R. V. Tagirov, and A. I. Shapiro
  Spectral solar variations during the eclipse of March 20^{th} 2015 at two European sites
  American Institute of Physics Conference Proceedings, 1810, 1

2016

- G. Cessateur, ..., R. V. Tagirov, et al.
  Solar irradiance observations with PREMOS filter radiometers on the PICARD mission: In-flight performance and data release
  Astronomy & Astrophysics, 588, A126

2015

- A. I. Shapiro, S. K. Solanki, N. A. Krivova, R. V. Tagirov and W. K. Schmutz
  The role of the Fraunhofer lines in solar brightness variability
  Astronomy & Astrophysics, 581, A116

Presentations

Sun-climate group seminar of Max-Planck-Institute for Solar System Research *MPS, Göttingen, Germany*

Invited talk *Nov. 2015*

Fixing Λ-Iterations in the NESSY code

Solar Metrology: Needs and Methods *Paris, France*

Conference poster *Oct. 2014*

Fast NLTE radiative transfer numerical scheme for solar spectrum modeling

Davos Atmosphere and Cryosphere Assembly (DACA-13) *Davos, Switzerland*

Conference poster *Jul. 2013*

Analysis of the solar eclipses observed with PREMOS/PICARD

8^{th} European Space Weather Weak *Namur, Belgium*

Conference splinter-session talk *Nov. 2011*

Analysis of the solar eclipses observed with PREMOS/PICARD

References

Dr. Yvonne Unruh

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Dr. Alexander Shapiro

Senior Scientist

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Department Sun and Heliosphere
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Prof. Dr. Werner Schmutz

Director

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