Ismail Rafatov

Current position:

Professor
Middle East Technical University
Department of Physics
Dumlupınar Blv. No: 1, 06800 Ankara, Turkey

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Personal Data

Date of birth: October 14, 1969

Place of birth: Bishkek, Kyrgyzstan

Citizenship: Republic of Turkey

Research Interests

Numerical methods for ODE's and PDE's and Computing; Numerical Modelling of Gas Discharge Plasma; Nonlinear Dynamics and Pattern Formation.

Education

2000, Mart

Ph.D. (Candidate of Physics and Mathematics), Supreme Attestation Commission of Russian Federation. Title of the thesis: *"Mathematical modelling of interaction of electromagnetic fields with plasma in a spherical microwave discharge*".

1995, July

Diploma in Applied Mathematics (with honours). Kyrgyzstan National University. Title of the Diploma thesis: "*Method of monotone operators and its application to the singular integral equations*".

Professional Appointments

- **September 2018 – present** Professor at the Middle East Technical University, Department of Physics, Ankara, Turkey
- **April 2011 – August 2018** Assoc. Professor at the Middle East Technical University, Department of Physics, Ankara, Turkey
- **June 2005 – Mart 2010** Assist. Professor at the Middle East Technical University, Department of Physics, Ankara, Turkey
- **April 2004 – April 2005** NATO-PC Postdoctoral research fellow at the Middle East Technical University, Department of Physics, Ankara, Turkey
- **February 2003 – Mart 2004** Postdoctoral research fellow at National Research Institute for Mathematics and Computer Science in the Netherlands (CWI, Amsterdam)
- **December 2001 – December 2002** Assist. Prof. at the Çanakkale Onsekiz Mart University, Turkey
- **August 1999 – December 2001** Assist. Prof. at American University of Central Asia and Kyrgyz-Turkish Manas University (part-time), Kyrgyzstan
- **November 1995 - November 1999** Research Assistant at the Mathematics Department of Kyrgyz Russian Slavic University, Kyrgyzstan

Teaching Experience

- **June 2005 – present** Lecturer, courses on Mathematical Methods in Physics; Methods of Mathematical Physics (for graduate students); Basic Linear Algebra; Introduction to Differential Equations; Introduction to Nonlinear Dynamical Systems and Chaos; Introduction to Plasma Physics; Introduction to Magnetohydrodynamics; Computational Methods in Plasma Physics (for graduate students), Analytical Mechanics (Middle East Technical University, Ankara, Turkey)
- **December 2001 – December 2002** Lecturer, courses on Computational Method for ODE's; Computational Method for PDE's (for graduate students); Complex Analysis, Calculus (Çanakkale Onsekiz Mart University, Turkey)
- **August 1999 – December 2001** Lecturer, courses on Probability Theory and Statistics; Calculus (American University of Central Asia, Kyrgyzstan)
- **October 1999 – December 2001** Part-time lecturer, courses on Discrete Mathematics; Linear Algebra; Differential Equations; Statistics; Financial Mathematics (Kyrgyz-Turkish Manas University, Kyrgyzstan)
- **September 1995** - **December 2000** Teaching assistant, Instructor, courses on Mathematical Analysis; Numerical Methods; Differential Equations; Linear Algebra and Analytical Geometry; Probability Theory and Statistics (Kyrgyz Russian Slavic University, Kyrgyzstan)

Supervised Theses

✓ **MS Theses**

Efe Hasan Kemaneci, "Numerical investigation of a dc glow discharge in an argon gas: two-component plasma model", METU, 2009

Ender Eylenceoğlu, "Numerical investigation of self-organization and stable burning conditions of moderate pressure glow discharges in argon gas", METU, 2011

Emrah Erden,"Simulation of glow discharge plasmas by using parallel Particle in cell /Monte Carlo collision method: the effects of number of super particles used in the simulations", METU, 2013 (Co-Supervisor)

Çınar Yüncüler, "One dimensional numerical analysis of plasma properties in the discharge channel of a Hall effect thruster", METU, 2014 (Co-Supervisor)

Gözde Özden, "Numerical modelling of spatio-temporal patterns in a DC-driven gas discharge-semiconductor system", METU, 2015 (Principal Supervisor)

Koray Kaymazlar, "Numerical analysis of plasma properties in the glow discharge: accuracy and applicability of simple and extended fluid models", METU, 2017

✓ **PHD Theses**

Cemre Kusoğlu, "Derivation of the parallel PIC/MCC numerical code and its application to the kinetic analysis of photoresonance plasma and the problem of identification of impurities within the PLES method, METU, 2017

Research Projects

TÜBİTAK – RFBR Joint Research Project 210T072 **Development of 2D kinetic computational codes for numerical modelling of nonlocal plasma of high and low pressure gas discharges, and their applications in innovative plasma technologies** 2011-2013 (Turkish project team leader)

TÜBİTAK – RFBR Joint Research Project 108T586 **Investigation of the self-organization and stable burning conditions of high pressure glow discharges** 2009-2011 (Turkish project team leader)

TÜBİTAK Research Project 106T705 **Numerical Investigation of Continuous Optical Discharge in Gas Flows** 2007-2008 (project leader)

Grants, Awards

- French Embassy Scholarship for Visiting Researchers (2017)
- TÜBİTAK's NATO-PC Advanced Fellowship (2004)
- FOM's (Fundamenteel Onderzoek der Materie) Research Fellowship (2003)
- ERCIM's (European Research Consortium for Informatics and Mathematics) Postdoctoral Research Fellowship (2002)
- Honorary Diploma in Applied Mathematics for outstanding achievements, Kyrgyz National State University (1995)
- Second prize of Education and Science Ministry of Kyrgyzstan, Republican Student Mathematical Olympiad (1992)

Languages

Fluent **Turkish** (native), **Russian** (language of education, YDS 2018: 100), and **English** (e-YDS 2017: 87.5)