

# Viatcheslav Bykov

## Curriculum Vitae

### Personal Details

Date and place of birth: March 19, 1974; Russia

Address: Institute of Technical Thermodynamics  
Karlsruher Institut für Technologie (KIT)  
Engelbert-Arndold-Straße 4, Geb. 10.91  
76131 Karlsruhe

Phones: work: +49-(0)721-60448746  
Mobile: +49-(0)176-24276820

Emails: [viatcheslav.bykov@kit.edu](mailto:viatcheslav.bykov@kit.edu)

Webpage: [http://www.itt.kit.edu/21\\_74.php](http://www.itt.kit.edu/21_74.php)

Scopus: <http://www.scopus.com/authid/detail.uri?authorId=7201795845>



### Education

**Habilitation** 2013, Reacting Flows, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany.

Mentor: Prof. Dr. rer. nat. habil. Ulrich Maas

Title of habilitation: Manifolds based model reduction for reacting flows

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**Ph.D.** 2004, Applied Mathematics, Department of Mathematics and Computer Science, Ben-Gurion University of the Negev, Israel.

Advisor: Prof. Vladimir Gol'dshtein

Title of thesis: Mathematical problems of multiphase combustion

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**M.Sc.** 1997, Mathematics, Mechanical and Mathematical Department, Novosibirsk State University, Novosibirsk, Russia.

Advisor: Prof. Vladimir Ogorodnikov

Title of thesis: On some probabilistic models of periodically correlated stochastic processes

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**B.Sc.** 1995, Applied Mathematics, Mechanical and Mathematical Department, Novosibirsk State University, Novosibirsk, Russia.

Advisor: Prof. Igor Borisov

Title of thesis: Capability and asymptotical normality of the estimation by maximal spacing

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## **Awards and Fellowships**

**2004 – 2006** Minerva Fellowship of Max Planck Society, Germany.

**2004** Friedman Prize for Outstanding Mathematicians, Math Department, Ben-Gurion University of the Negev, Israel.

**2000 – 2003** High Tech. fellowship for excellent Ph.D. students, Ben-Gurion University of the Negev, Israel.

## **Employment History**

**2004 – present** Research associate, Lecturer, Team leader of mathematical analysis of reacting flow systems, Institute of Technical Thermodynamics, Karlsruhe Institute of Technology (KIT), Germany.

**1999 - 2004** Teaching assistant (Ph.D. study), Ben-Gurion University of the Negev, Israel.

**1997 – 1998** Researcher, Institute of Applied Mathematics of the Far-Eastern Branch of the Russian Academy of Sciences, Khabarovsk, Russia.

## **Visiting Appointments**

Visiting researcher, consulting of the research projects

- Model reduction of mathematical models of spray combustion, Brighton University, England, summer/autumn, 2004; spring, 2010.
- Model reduction in combustion theory, Ben-Gurion University of the Negev, Israel, summer 2007 and 2013; winter 2015.
- Theory and modeling of two-phase combustion processes, Ben-Gurion University of the Negev, Israel, winter/spring, 2009.

## **Scientific Projects**

Leading, performing and consulting

- Project Principal Investigator (PI): DFG BY 94/2-1 - „Untersuchung der Dynamik von wasserstoffreichen Flammen, Entwicklung neuer Methoden zur Validierung von Mechanismen der chemischen Kinetik und zur Modellreduktion“
- Project Principal Investigator (PI): DFG SFB/Transregio TRR150, TP B07, “Modellreduktion für Reaktions-Transport-Systeme im Abgasstrang”
- Cooperating scientist: DFG GIF 1162-148.6/2011 “Model reduction approach for modeling of reacting flows”
- Investigator: DFG SFB606 “Non-Stationary Combustion: Transport Phenomena, Chemical Reactions, Technical Systems”

Reviewer of national / international foundations for scientific projects

- 2008 Combustion technology, Clean Combustion Concepts Program, Technologiestichting STW, Netherlands
- 2011 Basic research in natural sciences, Development and Innovation Funding (UEFISCDI), The Executive Agency for Higher Education and Research, Romania
- 2011, 2013 Basic research in natural sciences, National intellectual capacity program, National Centre of Science and Technology Evaluation, Kazakhstan

### **Education Activities (courses taught)**

- 2006 – pres.** Lecturer: Mathematical models and methods in combustion theory; Methods of model reduction for modelling and simulation of combustion processes; Karlsruhe Institute of Technology, Germany.
- 1999 – 2004** Teaching assistant: Calculus 1,2; Ordinary Differential Equations; Advanced Analysis; Algebra 1,2; Probability and Statistics, Ben-Gurion University of the Negev, Israel.
- 1997 – 1998** Teaching assistant: Mathematical analysis, the Khabarovsk State University of Technology, Russia.

## Recent presentations and talks at conferences, colloquia, seminars (since 2017)

- 1 Rich premixed hydrogen/air oscillatory flames: detailed modelling and model reduction, 7th International Congress on Energy Fluxes and Radiation Effects, Tomsk (Russia), September 14 – 26, **2020**
- 2 Reduced modelling of chemical kinetics in problems of flame acceleration and DDT, Annual International Symposium of Explosions and Reactive Flows, Beijing Institute of Technology, Beijing (China), September 26-27, **2020**
- 3 On dimension of a combustion system in the composition state space, International Workshop and School of Young Scientists, Vladivostok (Russia), October 12 – 16, **2020**
- 4 Role of chemical kinetics in flame acceleration in narrow channels, The 17th International Conference on Numerical Combustion, Aachen (Germany), May 6 – 8, **2019**
- 5 Reaction-Diffusion Manifolds (REDIMs) for premixed combustion systems – automatic manifold generation procedure, The 7th International Workshop on Model Reduction in Reacting Flows, Trondheim (Norway), June 18 – 21, **2019**
- 6 Model reduction of mechanisms of chemical kinetics: standard versus recently developed approaches, The 1st International Workshop: Non-linear phenomena and dynamics of flame propagation: theoretical aspects and implementations, Burabay (Kazakhstan), September 21-25, **2019**
- 7 Model reduction and mechanism comparison of hydrogen/oxygen auto-ignition, 37th International Symposium on Combustion, Dublin (Ireland), 29 July – August 5, **2018**
- 8 DRG and GQL reduction methods for a H<sub>2</sub>/Air auto-ignition problem, Joint the German and Italian Meeting of the Combustion Institute, Sorrento (Italy), 23 – 26 May, **2018**
- 9 Modelling of chemical kinetics of combustion processes: mechanisms generation, validation and model Reduction, 14th Int. Conf. on Flow Dynamics, ICFD, Sendai (Japan), 1–3 November 2017, **2017**
- 10 Hierarchical REDIM based reduced modeling and validation, 26th International Colloquium on the Dynamics of Explosions and Reactive Systems (ICDERS), Boston (US), July 30 – August 3, **2017**
- 11 Mechanisms of chemical kinetics: detailed modeling and model reduction, Ginzburg Centennial Conference on Physics, Moscow (Russia), 29 May–3 June, **2017**
- 12 Reduction of detailed reaction mechanism using characteristic time scales, 8th European Combustion Meeting, Dubrovnik (Croatia), April 19–21, **2017**
- 13 Formation and structure of accelerating combustion wave, 17th International Conference on Numerical Combustion, SIAM, Orlando (USA), April 3–5, **2017**
- 14 Singularly perturbed vector fields, model reduction of reacting flow systems, 3rd Workshop on Model Reduction of Complex Systems, Odense (Denmark), January 11–13, **2017**