

RESUME

March 2016

NAME Eugen Rabkin
ID: 313829889

BORN

March 10, 1965 in Gomel, Belorussia

ACADEMIC DEGREES

February 1987

M.Eng., Department of Physical Chemistry, Moscow Institute of Steel and Alloys, Russia (*diploma with distinction*)

January 1991

Ph.D., Institute for Solid State Physics of the Russian Academy of Sciences in Chernogolovka, Moscow district, Russia

ACADEMIC APPOINTMENTS

Since March 2015

Trudy and Normal Louis Chair in Engineering

Since July 2006

Full Professor at the TECHNION - Israel Institute of Technology

March 2014 – September 2014

Visiting Researcher at the Karlsruhe Institute of Technology, Germany

September 2005 – August 2006

Visiting Researcher at the Princeton University, USA

October 1997-June 2006

Associate Professor at the TECHNION - Israel Institute of Technology

January 1995 - September 1997

University Assistant at the Institut für Metallkunde, University of Stuttgart, Germany

May 1994 - December 1994

Research associate at the Institut für Metallkunde, University of Stuttgart, Germany

September 1992 - April 1994

Alexander-von-Humboldt Postdoctoral Fellow, Max Planck Institute for Metals Research (Group of Prof. W. Gust), Stuttgart, Germany

January 1991-August 1992

Research fellow at the Institute for Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia

PROFESSIONAL EXPERIENCE

February-March 1993, April-May 1994

Scientific advisor of PECHINEY corporation, Voreppe, France

January 2002 - March 2005

Scientific advisor of General Motors-Universal Motors Israel, Rishon Le Zion, Israel

RESEARCH INTERESTS

Internal interfaces in solids, phase transformations, thermodynamics, microstructure evolution, atomicforce microscopy, diffusion, nanoindentation, hydrogen in metals, alternative energy

TEACHING EXPERIENCE

In Germany:

Materials Science III: Solid State Reactions and Diffusion, graduate course

Materials Science II: Thermodynamic of Alloys, graduate course

Introduction to the Materials Science, undergraduate course

Extractive Metallurgy, graduate course

At the TECHNION:

(318319) Physical Fundamentals of Microstructure Evolution, graduate course

(315051) Diffusion in Solids, undergraduate course

(315052) Kinetics of Transformations in Solids, undergraduate course

(314533) Introduction to the Materials Engineering, undergraduate course

(318126) Structure and Stresses in Thin Films, graduate course

(318541) Fundamentals of near-field scanning probe microscopy and nanoindentation, graduate course

SPECIAL PROFESSIONAL ACTIVITIES

Member of the Editorial Boards:

-Journal of Materials Science

-Defect and Diffusion Forum

Key Reader of the "*Metallurgical & Materials Transactions A*"

2002-2004: EDITOR for Special Issues of the journal "*Interface Science*"

Member of the referee board of the following professional journals:

Acta Materialia, Scripta Materialia, Physical Review Letters, Journal of Alloys and Compounds, Defect and Diffusion Forum, Metallurgical and Materials Transactions, International Journal of Materials Research (formely: Zeitschrift fuer Metallkunde), Journal of Materials Research, Proceedings of Royal Society (London), International Journal of Solids and Structures, Intermetallics, Physica C, Materials Letters

Guest Editor of the journal "*Interface Science*":

1. Special Issue on capillary-driven shape evolution in solids, vol. 9, 2001.
2. Special Issue "Proceedings of IIB-2001", vol. 10, 2002 (together with W. Kaplan and R. Schneck).

Independent Scientific Expert of the European Community

(INTAS Program)

HONORS

April 1983 *The first prize* in student's All-Union contest in physics (Russia)

June 1994 *Otto-Hahn Medal* for young outstanding scientists of the Max-Planck Society (Germany)

July 1997 *Gledden visiting senior research award* (Australia)

January 1999 *Guastala Fellowship* for young outstanding faculty members at the Israeli Universities (Israel)

July 1999 *Federation of European Materials Research Societies Lecturer* (European Union)

January 2004 *Science Prize of the German Technion Society* for the personal contribution to Israeli-German scientific cooperation (Germany)

June 2004 *Henry Taub Prize* for excellence in research (Israel)

GRADUATE STUDENTS

1995-1998; Li-Shin Chang; Ph. D. Thesis: *Study of the thermodynamics and kinetics of grain boundary segregation of Bi in Cu*. Primary supervisor: Prof. W. Gust, University of Stuttgart; additional supervisor: E. Rabkin

1999-2001; Amir Finkel; M.Sc. Subject: *The effect of exposure to elevated temperatures on the microstructure and hardness of die cast Mg-Ca-Zn alloys*. Supervisor: E. Rabkin

2000-2003; Yaron Amoyal; M.Sc. Subject: *The correlation between grain boundary energy, crystallography and chemical composition in the intermetallic compound NiAl*; Supervisor: E. Rabkin

2001-2003; Esta Abelev (Rabinovich); M.Sc. Subject: *Electrochemical behavior of Cu in aqueous solutions for chemical-mechanical planarization applications*. Primary supervisor: E. Rabkin, additional supervisor: Y. Ein-Eli

2003-2007; Tal Eliash; M.Sc. Subject: *Nanomechanical properties of the fine- and coarse grained molybdenum*; Supervisor: E. Rabkin

2003-2007; Yaron Amoyal; Ph.D. Subject: *Thermodynamics and kinetics of grain boundaries in ultrafine grained alloys*; Supervisor: E. Rabkin

2004-2006; Eli Buchman; M.Sc. Subject: *The effect of nanostructuring on hydrogen storage properties of Mg-based alloys*; Supervisor: E. Rabkin; additional supervisor: E. Gutmanas

2005-2007; Angelina Gabelev; M.Sc. Subject: *The effect of plastic strain on grain growth in thin metallic films*; Supervisor: E. Rabkin

2005-2008; Refael Levi; M. Sc. Subject: *Liquid metal embrittlement of AISI 4340 low alloy steel by Ga-In eutectics*; Supervisor: E. Rabkin

2009-2012; Orit Even-Tsur; M. Sc. Subject: *Growth and characterization of carbon nanotubes forests*; Supervisor: E. Rabkin, additional supervisor: Y. Yaish.

2009-2013; Artoum Rakovsky; Ph.D. Subject: *Bioinspired calcium phosphate – polylactide nanocomposites and scaffolds with controlled pore architecture for bone tissue regeneration*; Supervisor: E. Rabkin, additional supervisors: E. Gutmanas and I. Gotman.

2010-2015; Dor Amram; Ph.D. Subject: *Morphology and microstructure evolution in Au-Fe bilayers on sapphire*; Supervisor: E. Rabkin

2010-2013; Rotem Carmi; M.Sc. Subject: *Grain boundary diffusion as a tool for tailoring mechanical properties of thin Au films*; Supervisor: E. Rabkin

2011-2013; Larisa Popilevsky; M.Sc. Subject: *Hydrogen storage alloys based on Mg-Ni eutectics*; Supervisor: E. Rabkin

2011-2013; Oleg Kovalenko; M.Sc. subject: *The effect of size, shape, and pre-strain on plastic deformation of iron nanoparticles*; Supervisor: E. Rabkin

2013-...; Oleg Kovalenko; Ph.D. subject: *Microstructure and mechanics of metal nanoparticles*; Supervisor: E. Rabkin

2013-...; Larisa Popilevsky; Ph.D. Subject: *Novel Mg-based porous metal matrix composites for hydrogen storage*; Supervisor: E. Rabkin

2011-2015; Gal Ophir; M.Sc. subject: *Surface analysis of contact interface in MEMS switches*; Supervisor: E. Rabkin

2013-...; Nimrod Gazit; Ph.D. subject: *Producing hollow metal nanostructures by grain boundary diffusion*; Supervisor: E. Rabkin

2016-...; Ehud Almog; M.Sc. subject: *Manipulating mechanical properties of hollow and porous metal nanostructures by heat treatments and diffusion*; Supervisor: E. Rabkin

RESEARCH GRANTS

1998-2001; Israel Science Foundation

Grain boundary engineering as a tool for control of microstructure in the binary alloys with the liquid phase particles

Budget: 174,650 US\$, PI: E. Rabkin

1999-2001; Das Land Niedersachsen

Kinetic processes in the bulk and in the grain boundaries in ordered intermetallics on the NiAl basis

Budget: 181,000 DM (81,000 DM for the Technion), PIs: E. Rabkin and Th. Hehenkamp (Germany)

1998-2001; Israeli Ministry of Science

Fabrication of the graded surface layers by CO₂ laser cladding with direct powder injection

Budget: 550,000 NIS for the Technion, PI: M. Dariel (Ben-Gurion Univ., Beer-Sheva)

1998-2001; European Union (INTAS Network)

A new method for study of energetic and kinetic properties of surfaces and grain boundaries in metallic materials

Budget: 77,000 EURO (9,000 EURO for the Technion), PI: E. Rabkin

1998-2000; European Union (COPERNIKUS Network)

Crystals with controlled shape and microstructure for science and industry

Budget: 159,800 EURO (10,100 EURO for the Technion), PI: W. Gust (Germany)

2001-2004; US-Israel Binational Science Foundation (BSF)

Energy and structure of grain boundaries in NiAl

Budget: 75,000 US\$ (61,000 US\$ for the Technion), PIs: E. Rabkin and Y. Mishin (USA)

2001-2003; Ashot-Ashkelon Ltd.

Development of CO₂ laser treatment processing that provides required properties of treated area

Budget: 106,000 US\$, PI: E. Rabkin

2002-2004; RAFAEL Ltd.

Microstructure and properties of ultrafine grained copper and molybdenum produced by severe plastic deformation

Budget: 253,000 NIS (4 years), PI: E. Rabkin

2002; Israel Science Foundation

Nanoindentation system (equipment grant)

Budget: 50,000 US\$, PI: E. Rabkin

2003-2004; General Motors – Universal Motors Israel

Modification of hydrogen storage properties of V and Mg alloys by severe plastic deformation

Budget: 70,000 US\$, PI: E. Rabkin

2004-2007; Israeli Ministry of Industry, Trade and Employment

Mechanical properties and agglomeration of nano functional materials (MAGNET program)

Budget: 970,000 NIS (3 years), PI: Dr. Y. Tsur, CI: E. Rabkin

2004-2008; Israel Science Foundation

Thermodynamics and kinetics of grain boundaries in ultrafine grained copper alloys obtained by severe plastic deformation

Budget: 800,000 NIS (4 years), PI: E. Rabkin

2005; Israeli Center for Academic Relations with the CIS and Baltic States (Hebrew University, Jerusalem)

Nanoscale mechanical properties and deformation mechanisms of ultrafine grain metallic alloys produced by severe plastic deformation

Budget: 40,000 NIS, PI: E. Rabkin

2005-2010; European Commission

European Network of Excellence in the field of advanced nanostructured coatings

Budget: 17,000 EUR (first year), PI: Prof. E. Gutmanas, CI: E. Rabkin

2007-2011; US-Israel Binational Science Foundation (BSF)

The effect of size, shape and temperature on plastic deformation of gold nanoparticles on sapphire

Budget: 135,000 US\$, PIs: E. Rabkin and D.J. Srolovitz (USA)

2007; Russell Berry Nanotechnology Institute, Umbrella Cooperation Program with RWTH Aachen

The free volume of grain boundaries and its effect on microstructural stability of nanocrystals

Budget: 20,000 US\$ (10,000 for the Technion), PI: E. Rabkin, G. Gottstein

2009-2010; Israeli Ministry of Science, Culture and Sport, Israel-Russia cooperation program

Abnormal deformation-driven diffusion in nanostructured Cu-based alloys

Budget: 156,000 NIS (for the Technion), PIs: E. Rabkin and B.B. Straumal (Russia)

2009; Russell Berry Nanotechnology Institute, Cooperation Program with Ben Gurion University

Synthesis and magnetic properties of Au-Fe nano-onions and core-shell nanoparticles

Budget: 50,000 NIS for the Technion, PI: E. Rabkin, R. Shnek

2009-2013; Israel Science Foundation

Grain boundary diffusion as a tool for tailoring of mechanical properties of nanocrystalline thin films

Budget: 1,000,000 NIS (4 years), PIs: E. Rabkin, D. Sherman

2010-2016; Israel Ministry of Defence

Self-activating explosive micro-charges based on metal-hydride composites

Budget: 1,200,000 NIS (5 years), PI: E. Rabkin

2010; Russell Berry Nanotechnology Institute, NEVET Program

The role of small grains in stability of nanocrystalline thin films

Budget: 40,000 US\$, PI: E. Rabkin, A. Novick-Cohen

2012-2013; Grand Technion Energy Program, NEVET Program

Catalyzed hydrogen storage in Magnesium – Carbon nanocomposites

Budget: 20,000 US\$, PIs: E. Rabkin, O. Regev

2011-2015; US-Israel Binational Science Foundation (BSF)

The effect of size, shape and pre-strain on plastic deformation of nanoparticles of body centered cubic metals

Budget: 185,000 US\$ (4 years), PIs: E. Rabkin and J. Greer (USA)

2011-2014; Israel Strategic Alternative Energy Foundation (I-SAEF)

Porous metal matrix – hydride – carbon nanotubes composites for hydrogen storage

Budget: 200,000 US\$ (3 years), PI: E. Rabkin

2013-2015; German-Israeli Foundation for Scientific Research and Development (GIF)

Diffusion-assisted synthesis and thermal stability of metal nanotubes and nano-channels

Budget: 180,000 EUR (3 years), PIs: E. Rabkin, G. Richter

2015; Israel Ministry of Defence

Reliability study of the hydrogen storage tanks

Budget: 75,000 NIS, PI: E. Rabkin

2015-2016; Grand Technion Energy Program, Adelis Foundation

Enhanced Hydrogen Absorption and Desorption in Magnesium-Graphene Composites

Budget: 20,000 US\$, PIs: E. Rabkin, O. Regev

2015-2019; Israel Science Foundation

Diffusion along the interfaces between dissimilar materials

Budget: 1,120,000 NIS (4 years), PI: E. Rabkin

2015-2019; US-Israel Binational Science Foundation (BSF)

Manipulating mechanical properties of hollow rigid nanolattices by heat treatments and diffusion

Budget: 185,000 US\$ (4 years), PIs: E. Rabkin and J. Greer (USA)

2015-2018; Israel Science Foundation-China cooperation program

Understanding the laws of diffusion at the nanoscale: diffusion in nanoparticles and nanolayered structures

Budget: 540,000 NIS (3 years), PIs: E. Rabkin, Jiang Wang (PR China, Shantou University)

2016-2018; Israeli Ministry of Science and Technology, Israel-Russia cooperation program

The topology of liquid metal penetration through the 3D-networks of wetted and interconnected 2D and 1D lattice defects

Budget: 480,000 NIS (3 years), PIs: E. Rabkin and B.B. Straumal (Russia)

2016-2019; joint US-Israel Binational Science Foundation (BSF) – NSF programme in Materials

Diffusion along Metal-Ceramic Interfaces: a combined theoretical and experimental study

Budget: 240,000 US\$ (3 years), PIs: E. Rabkin and D.J. Srolovitz (USA)