Roman Anufriev

Address: 4-6-1 Komaba, Fe-207, Meguro, Tokyo, Japan
E-mail: anufriev@iis.u-tokyo.ac.jp
Date of birth: 04 October 1986

Research experience

2018 – pres. | Research Associate at the University of Tokyo
2014 – 2018 | PostDoc at the University of Tokyo
2010 – 2013 | PhD at Lyon Nanotechnology Institute (INL)
2009 – 2010 | Master at Saint Petersburg Academic University

Education

PhD | Institut National des Sciences Appliquées (INSA) de Lyon (2013)
Supervisors: C. Bru-Chevallier and N. Chauvin
Title: "Optical properties of III-V nanowire heterostructures grown on silicon substrates"

M.S. | Saint Petersburg Academic University of the Russian Academy of Sciences (2010)
Major: Electronics and microelectronics.
Supervisor: M. A. Kaliteevski
Title: "Simulation of Tamm plasmon polaritons in multilayered cylindrical structures"

Skills and expertise

Time-domain thermoreflectance (TDTR)
Brillouin light scattering spectroscopy
Photoluminescence spectroscopy (PL, Micro-PL, PLE, TR-PL)
Electron and atomic force microscopy
Nanostructure simulations using Python, Matlab, Comsol, and Nextnano^3
Nano-fabrication in clean room (EB lithography, ICP RIE, physical deposition, etc.)
Background in the solid state physics (semiconductor optics, nanoscale heat transport, phononics)
English (Advanced), French (B1—B2), Polish (Beginner) Russian (Native)

Grants and awards

2020 – Best Review Award from JAPS
2019 – The Junior Prize of the IPPA
2019 – PRESTO JST grant
2018 – Kakenhi JSPS grant
2017 – JSAP Young Author Award
2016 – Certificate of merit for "Thermal Engineering Best Paper" from the JSME
2016 – Postdoctoral scholarship of the JSPS

Patents

発明者：野村政宏、R. Anufriev, A. Ramiere, J. Maire, 出願番号：特願 2017-095459, 発明の名称：熱流方向性制御構造, 出願日： May 12 2017

発明者：野村政宏、R. Anufriev, 柳澤亮人, Anthony George, 出願番号：特願 2017-154070, 発明の名称：熱電変換材料およびその製造方法, 出願日： August 9 2017

Publications

R. Anufriev, M. Nomura
"*Ray phononics: thermal guides, emitters, filters, and shields powered by ballistic phonon transport*"
Materials Today Physics 15, 100272, 2020 (IF 10.4)

R. Anufriev, S. Tachikawa, S. Gluchko, Y. Nakayama, T. Kawamura, L. Jalabert, M. Nomura
"Cross-plane thermal conductivity in amorphous Si/SiO2 superlattices"
Applied Physics Letters 117, 093103, 2020

Y. Wu, J. Ordonez-Miranda, S. Gluchko, R. Anufriev, DDS. Meneses, L Del Campo, S. Volz, M. Nomura
"*Enhanced thermal conduction by surface phonon-polaritons*"
Science Advances 6 (40), eabb446, 2020 (IF 12.5)

S. Tachikawa, J. Ordonez-Miranda, Y. Wu, L. Jalabert, R. Anufriev, S. Volz, M. Numura
"*High Surface Phonon-Polariton in-Plane Thermal Conductance along Coupled Films*"
Nanomaterials 10 (7), 1383, 2020

X. Huang, D. Ohori, R. Yanagisawa, R. Anufriev, S. Samukawa, M. Nomura
"*Coherent and incoherent impacts of nanopillars on the thermal conductivity in silicon nanomembranes*"
ACS Applied Materials & Interfaces 12 (22), 25478–25483, 2020 (IF 8.7)

R. Anufriev, J. Ordonez-Miranda, M. Nomura
"*Measurement of the phonon mean free path spectrum in silicon membranes at different temperatures using arrays of nanoslits*"
Physical Review B 101, 115301, 2020

N. Okamoto, R. Yanagisawa, R. Anufriev, Md M. Alam, K. Sawano, M. Kurosawa, M. Nomura
"Semiballistic thermal conduction in polycrystalline SiGe nanowires"
Applied Physics Letters 115, 253101, 2019

X. Huang, S. Gluchko, R. Anufriev, S. Volz, M. Nomura
"*Thermal Conductivity Reduction in a Silicon Thin Film with Nanocones"*
ACS applied materials & interfaces 11, 34394-34398, 2019 (IF 8.7)

A. George, R. Yanagisawa, R. Anufriev, J.He, N. Yoshie, N. Tsujii, Q. Guo, T. Mori, S. Volz, M. Nomura
"Thermoelectric Enhancement of Silicon Membranes by Ultrathin Amorphous Films"
ACS Applied Materials & Interfaces, 11, 12027, 2019 (IF 8.7)

R. Anufriev and M. Nomura
"Coherent thermal conduction in silicon nanowires with periodic wings"
Nanomaterials 9, 142, 2019

S. Gluchko, R. Anufriev, R. Yanagisawa, S. Volz, M. Nomura
"On the reduction and rectification of thermal conduction using phononic crystals with pacman-shaped holes"
Applied Physics Letters 114, 023102, 2018

R. Anufriev, S. Gluchko, S. Volz, M. Nomura
"*Probing ballistic thermal conduction in segmented silicon nanowires*"
Nanoscale 11, 13407, 2019 (IF 6.8)

R. Anufriev, S. Gluchko, S. Volz, M. Nomura
"Quasi-ballistic heat conduction due to Lévy phonon flights in silicon nanowires"
ACS Nano 12 (12), 11928, 2018 (IF 14.6)

R. Anufriev and M. Nomura
"*Phonon and heat transport control using pillar-based phononic crystals*"
Science and Technology of Advanced Materials 19, 863, 2018

M. Nomura, J. Shiomi, T. Shiga, and R. Anufriev
"*Thermal phonon engineering by tailored nanostructures*"
Japanese Journal of Applied Physics 57, 080101, 2018

J. Maire, R. Anufriev, T. Hori, J. Shiomi, S. Volz, and M. Nomura
"*Thermal conductivity reduction in silicon fishbone nanowires*"
Scientific Reports 8, 4452, 2018

R. Anufriev, R. Yanagisawa, and M. Nomura
"*Aluminium nanopillars reduce thermal conductivity of silicon nanobeams*"
Nanoscale, 9, 15083, 2017 (6.8)

J. Maire, R. Anufriev, R. Yanagisawa, A. Ramiere, S. Volz and M. Nomura
"Heat conduction tuning by wave nature of phonons"
Science Advances, 3, e1700027, 2017 (IF 12.5)

M. Verdier, R. Anufriev, A. Ramiere, K. Termentzidis, D. Lacroix
"*Thermal conductivity of phononic membranes with aligned and staggered lattices of holes at room and low temperatures*"
Physical Review B, 95, 155432, 2017

R. Anufriev, A. Ramiere, J. Maire and M. Nomura
"Heat guiding and focusing using ballistic phonon transport in phononic nanostructures"
Nature Communications, 8, 15505, 2017 (IF 12.1)

R. Anufriev and M. Nomura
"Heat conduction engineering in pillar-based phononic crystals"
Physical Review B, 95, 155432, 2017

R. Yanagisawa, J. Maire, A. Ramiere, R. Anufriev and M. Nomura
"Impact of limiting dimension on thermal conductivity of one-dimensional silicon phononic crystals"
Applied Physics Letters, 110, 133108, 2017

J. Maire, R. Anufriev and M. Nomura
"Ballistic thermal transport in silicon nanowires"
Scientific Reports, 7, 41794, 2017

R. Anufriev, J. Maire and M. Nomura
"Reduction of thermal conductivity by surface scattering of phonons in silicon periodic nanostructures"
Physical Review B, 93, 045411, 2016

R. Anufriev and M. Nomura

"Reduction of thermal conductance in two-dimensional phononic crystals by coherent phonon scattering"
Physical Review B, 93, 045410, 2016

R. Anufriev and M. Nomura
"Thermal conductance boost in phononic crystal nanostructures"
Physical Review B, 91, 245417, 2015

R. Anufriev, J.B. Barakat, G. Patriarche, X. Letartre, C. Bru-Chevallier, J.C. Harmand, M. Gendry, N. Chauvin
"Optical polarization properties of InAs/InP quantum dot and quantum rod nanowires"
Nanotechnology, 26, 395701, 2015

M. Nomura, Y. Kage, J. Nakagawa, T. Hori, J. Maire, J. Shiomi, R. Anufriev, D. Moser, and O. Paul
"Impeded thermal transport in Si multiscale hierarchical architectures with phononic crystal nanostructures"
Physical Review B, 91, 205422, 2015

R. Anufriev, N. Chauvin, H. Khmissi, K. Naji, G. Patriarche, M. Gendry, and C. Bru-Chevallier
"Piezoelectric effect in InAs/InP quantum rod nanowires"
Applied Physics Letters, 104, 183101, 2014

R. Anufriev, N. Chauvin, H. Khmissi, K. Naji, G. Patriarche, M. Gendry, and C. Bru-Chevallier
"Quantum efficiency of InAs/InP nanowire heterostructures grown on silicon substrates"
Physica Status Solidi (RRL), 7, 878, 2013

R. Anufriev, N. Chauvin, H. Khmissi, K. Naji, J.-B. Barakat, J. Penuelas, G. Patriarche, M. Gendry, and C. Bru-Chevallier
"Polarization properties of single and ensembles of InAs/InP quantum rod nanowires emitting in the telecom wavelengths"
Journal of Applied Physics, 113, 193101, 2013

R. Anufriev, N. Chauvin, H. Khmissi, K. Naji, M. Gendry, and C. Bru-Chevallier
"Impact of substrate-induced strain and surface effects on the optical properties of InP nanowires"
Applied Physics Letters, 101, 072101, 2012.

N. Chauvin, M. H. H. Alouane, R. Anufriev, H. Khmissi, K. Naji, G. Patriarche, C. Bru-Chevallier, and M. Gendry
"Growth temperature dependence of exciton lifetime in wurtzite InP nanowires grown on silicon substrates"
Applied Physics Letters, 100, 011906, 2012

C. E. Little, R. Anufriev, I. Iorsh, M. A. Kaliteevski, R. A. Abram, and S. Brand
"Tamm plasmon polaritons in multilayered cylindrical structures"
Physical Review B, 86, 235425, 2012

M. H. H. Alouane, R. Anufriev, N. Chauvin, H. Khmissi, K. Naji, B. Ilahi, H. Maaref, G. Patriarche, M. Gendry, and C. Bru-Chevallier
"Wurtzite InP/InAs/InP core-shell nanowires emitting at telecommunication wavelengths on Si substrate"
Nanotechnology, 22, 405702, 2011

Invited talks

R. Anufriev and M. Nomura
"*Ray phononics: ballistic analogues of thermal phononic devices*"
4th Phonon Engineering Workshop, Tokyo, Japan (2020)

R. Anufriev, S. Gluchko, S. Volz, and M. Nomura,
"*Ballistic heat conduction in semiconductor nanowires*"
International Summer School-Conference "Advanced Problems in Mechanics", 82589822556-1610, St. Petersburg, Russia (2020)

R. Anufriev and M. Nomura
"*Ballistic thermal transport in silicon nanowires*"
Nanowire week, Pisa, Italy (2019)

R. Anufriev and M. Nomura
"*Time-Domain Thermoreflectance for Thermal Characterization of Nanostructures*"
20th International Conference on Photoacoustic and Photothermal Phenomena, Moscow (2019)

R. Anufriev, R. Yanagisawa, and M. Nomura
"*Surface engineering of nanobeams and nanomembranes for silicon-based thermoelectrics*"
Collaboratie Conference on Materials Research, 312, Seoul, Korea (2018)

Full list of talks: https://www.nlab.iis.u-tokyo.ac.jp/publications-e.html#lectures_international_section