

CURRICULUM VITAE

Ilia A. Pankin



Personal Information

Family name, Given name: Pankin, Ilia
Date of Birth: 16 June 1992
Nationality: Russian
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Research ID: P-3517-2015

Education

2016 – now PhD in physics, Southern Federal University (Russia)
Title: «Nanoscale local atomic structure of the catalytic active sites in Me-exchanged zeolites: synchrotron experiments and theoretical modelling»
Supervisor: Prof. Alexander V. Soldatov, Prof. Silvia Bordiga

2016 – 2019 PhD in Chemical and Material Sciences, University of Turin (Italy)
Title: «Synchrotron-based XAS experiment and theoretical modelling on metal exchanged zeotypes used in catalysis»
Supervisor: Prof. Silvia Bordiga (Prof. Carlo Lamberti)

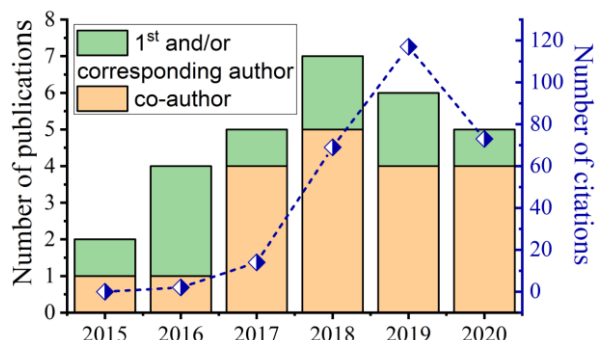
2014 – 201 Master degree in Physics, Southern Federal University

Languages

- Russian (native speaker)
- English (advanced)
- Italian (beginner)

Current positions:

Young Researcher The Smart Materials Research Institute, Southern Federal University
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Publication summary (06/2020)

30 publications in *Scopus* and *Web of Science*
275 (313) citations in *Scopus* (*GoogleScholar*)
6 (6) *h*-index in *Scopus* (*GoogleScholar*)

Selected publications:

- 1) **I.A. Pankin**, A. Martini, K.A. Lomachenko, A.V. Soldatov, S. Bordiga, E. Borfecchi "Identifying Cu-oxo species in Cu-zeolites by XAS: a theoretical survey by DFT-assisted XANES simulation and EXAFS wavelet transform" *Catalysis Today* **2020** 345 pp. 125-135
- 2) V.V. Butova, K.S. Vetlitsyna-Novikova, **I.A. Pankin**, K.M. Charykov, A.L. Trigub, and A.V. Soldatov "Microwave synthesis and phase transition in UiO-66/MIL-140A system" *Microporous & Mesoporous Materials* **2020** 296 109998
- 3) A. Martini, **I.A. Pankin**, A. Marsicano, K.A. Lomachenko, E. Borfecchia "Wavelet analysis of a Cu-oxo zeolite EXAFS simulated spectrum" *Radiation Physics and Chemistry* **2020** (in press)
- 4) **I.A. Pankin**, E. Borfecchi, A. Martini, K.A. Lomachenko, C. Lamberti, A.V. Soldatov "DFT-assisted XANES simulations to discriminate different monomeric Cu^{II} species in CHA catalysts" *Radiation Physics and Chemistry* **2019** 108510 (in press)
- 5) C. Buono, A. Martini, **I.A. Pankin**, D.K. Pappas, C. Negri, K. Kvande, K.A. Lomachenko, E. Borfecchia "Local structure of Cu(I) ions in the MOR zeolite: A DFT-assisted XAS study" *Radiation Physics and Chemistry* **2019** (in press)
- 6) A. L. Bugaev, A. A. Guda, **I. A. Pankin**, E. Groppo, R. Pellegrini, A. Longo, A. V. Soldatov, C. Lamberti "The role of palladium carbides in the catalytic hydrogenation of ethylene over supported palladium nanoparticles" *Catalysis Today* **2019** 336 pp. 40-44 (in press)
- 7) Guda, A. A.; Guda, S. A.; Lomachenko, K. A.; Soldatov, M. A.; **Pankin, I. A.**; Soldatov, A. V.; Braglia, L.; Bugaev, A. L.; Martini, A.; Signorile, M.; Groppo, E.; Piovano, A.; Borfecchia, E.; Lamberti, C. "Quantitative structural determination of active sites from in situ and operando XANES spectra: From standard ab initio simulations to chemometric and machine learning approaches" *Catalysis Today* **2019** pp. 336 pp. 3-21
- 8) A.L. Bugaev, O.A. Usoltsev, A.A. Guda, K.A. Lomachenko, **I.A. Pankin**, Yu.V. Rusalev, H. Emerich, E. Groppo, R. Pellegrini, A.V. Soldatov, J.A. van Bokhoven, C. Lamberti "Palladium Carbide and Hydride Formation in the Bulk and at the Surface of Palladium Nanoparticles" *The Journal of Physical Chemistry C* **2018** 122 (22) pp. 12029–12037
- 9) M A Soldatov, A. Martini, A. L Bugaev, **I.A. Pankin**, P. V. Medvedev, A. A. Guda, A. M. Aboaraia, Y. S. Podkovyrina, A. P. Budnik, A.V. Soldatov, C. Lamberti "The insights from X-ray absorption spectroscopy into the local atomic structure and chemical bonding of Metal–organic frameworks" *Polyhedron* **2018** 155 pp. 232-253
- 10) **I.A. Pankin**, A.A. Guda, N.A. Tumanov, Ya. Filinchuk, K.A. Lomachenko, A.L. Bugaev, S.A. Guda, V.V. Shapovalov, C. Lamberti, A.V. Soldatov "Experimental and theoretical study of hydrogen desorption process from Mn(BH₄)₂" *Journal of Alloys and Compounds* **2018** pp. 735 277-284 (Impact-factor: 3.779 / Q1) DOI: 10.1016/j.jallcom.2017.11.062
- 11) M. Mortén, Ł. Mentel, A. Lazzarini, **I.A. Pankin**, C. Lamberti, S. Bordiga, V. Crocella, S. Svelle, K. P. Lillerud, U. Olsbye "A systematic study of isomorphically substituted H-MeAlPO-5 materials for the Methanol to Hydrocarbons (MTH) reaction" *ChemPhysChem* **2018** 19 (4) pp. 484-495
- 12) D. K. Pappas, E. Borfecchia, M. Dybala, **I. A. Pankin**, K.A. Lomachenko, A. Martini, M. Signorile, S. Teketel, B. Arstad, G. Berlier, C. Lamberti, S. Bordiga, U. Olsbye, K.P. Lillerud, S. Svelle, and P. Beato "Methane to Methanol: Structure–Activity Relationships for Cu-CHA" *Journal of the American Chemical Society* **2017** 139 pp. 14961-14975
- 13) A. Martini, E. Borfecchia, K. A. Lomachenko, **I. A. Pankin**, C. Negri, G. Berlier, P. Beato, H. Falsig, S. Bordiga, C. Lamberti "Composition-driven Cu-speciation and reducibility in Cu-CHA zeolite catalysts: a multivariate XAS/FTIR approach to complexity" *Chemical Science* **2017** 8

Fellowships and Awards:

- International school for young researchers IWSN-2018, award for best oral report **2018** (Rostov-on-Don, Russia)
- HERCULES (Higher European Research Course For Users of Large Experimental Systems), Best poster award **2018** (Grenoble, France)
- Haldor Tospoe PhD fellowship (**2017-2019**)
- Russian Government sponsorship programme for mission abroad (**2019**)
- Russian Government scholarship (**2018**)
- 2nd Russian national conference «Science of the Future», Best oral report on the section “New materials and technological processes”, **2016** (Kazan, Russia)
- International conference for PhD and young researchers «Lomonosov 2016», Best oral report on the section “Condensed matter physics” **2016** (Moscow, Russia)
- Russian national conference for students and young researchers in Physics «VNKSF-22», award for best oral presentation **2016** (Taganrog, Russia)
- XXIII Russian national Kurchatov’s conference, award for best oral report **2015** (Moscow, Russia)
- National school on modern characterization techniques for nanomaterials «Synchrotron based techniques and neutron experiments» (СИИ-НАНО), award for best oral report **2015** (Moscow, Russia)
- Russian national conference for students and young researchers in Physics «VNKSF-21», award for best oral presentation **2015** (Omsk, Russia)
- International School for Young
- "Philip Morris" Corp. Scholarship holder (**2014**)
- "Center-Invest" bank scholarship program for student and young researchers for the achievements in education and research activity (**2014, 2015, 2016**)
- Rostov region government scholarship for students and young researchers (**2014, 2016**)
- International school for young researchers IWSN-2014, award for best poster report **2014** (Kaliningrad, Russia)

Training course and internships:

- Internship at BM-23 at ESRF synchrotron facility **2020** (Grenoble, France)
- Crystallography and X-ray diffraction school «Crisdi School» **2019** (Turin, Italy)
- International school on Synchrotron and Neutron radiation HERCULER **2018** (Grenoble, France & Hamburg, Germany)
- Internship at Haldor Topsoe Research Laboratories **2018** (Lyngby, Denmark)
- Fullbright Summer School in Science and Technology “Nanotechnologies and Nanomaterials” **2016** (Kazan, Russia)
- EUSpec Winter School on core level spectroscopies (EWinS-2016) **2016** (Ajdovscina, Slovenia)
- International School “Smart Nanomaterials and X-ray Optics” **2015** (Rostov-on-Don, Russia)
- German-Russian joined school for students and young researchers on Material Science «Travelling seminar» **2015** (Berlin, Rostov, Hamburg, Cologne; Germany)
- National school on modern characterization techniques for nanomaterials «Synchrotron based techniques and neutron experiments» **2015** (Moscow, Russia)
- RACIRI International Summer School: Advanced Materials Design at X-ray and Neutron Facilities **2014** (Petrogof, Russia)

Experiments at synchrotrons

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| 06/2016 | Investigation of local atomic and electronic structures in doped CdSe quantum dots (STM beamline, Kurchatov Synchrotron Radiation Source, Russia) |
| 11/2016 | Structure-activity relationship in the deNO _x Cu-CHA catalyst: exploring the effect of composition tuning by HERFD-XANES and XES (ID-26, ESRF, France) |
| 11/2016 | Exploring the direct methane to methanol conversion on Cu-zeolites and Cu-MOFs: a combined XAS/XES study» (BM-26A, ESRF, France) |
| 12/2016 | <i>In situ</i> atomic structure and catalytic properties relationship for the palladium catalyst under industrially relevant conditions (BM-26A, ESRF, France) |
| 03/2017 | Towards predictive models for zeotype catalysed reactions: Probing the chemical state and incorporation of heteroatoms (M) in MAPO-5 by combined operando XAS/XRD experiments (BM-31, ESRF, France) |
| 05/2017 | Investigation of the oscillatory behavior of hydrogenation reaction on the palladium nanoparticles by time-resolved X-ray absorption spectroscopy (Super-XAS beamline, SLS, Switzerland) |
| 05/2017 | Advanced X-ray Spectroscopies of Novel Composites for Theranostics: Cross-linked Quantum Dots and Magnetic Nanoparticles (ID-26, ESRF, France) |
| 10/2017 | Radiation-induced active sites modification of Cu-CHA catalyst (ID-24, ESRF, France) |
| 12/2017 | Site/reactants interaction in heterogeneous catalysts highlighted by operando TEY NEXAFS experiments at ambient pressure. Exp I (APE beamline, Elettra synchrotron, Italy) |
| 07/2018 | Temperature-dependent NH ₃ -assisted selective catalytic reduction of NO _x monitored by Operando XAS and XES over Cu-, Fe-, and Cu-Fe-zeolites (BM-23, ESRF, France) |
| 12/2018 | Site/reactants interaction in heterogeneous catalysts highlighted by operando TEY NEXAFS experiments at ambient pressure. Exp II (APE beamline, Elettra synchrotron, Italy) |
| 06/2019 | Investigation of phase formation in UiO-66/MIL-140A systems upon microwave synthesis (STM beamline, Kurchatov Synchrotron Radiation Source, Russia) |

Oral Presentations at International Conferences:

- 16 International conference [XAFS-16 2015](#) (Karlsruhe, German)
- German-Russian joined school for students and young researchers on Material Science «Travelling seminar» **2015** (Hamburg, Germany)
- International conference «Science of the Future» **2016** (Kazan, Russia)
- EUSpec Winter School on core level spectroscopies ([EWinS-2016](#)) **2016** (Ajdovscina, Slovenia)
- International conference «Synchrotron and Free electron laser Radiation: generation and application» ([SFR-2016](#)) **2016** (Novosibirsk, Russia)
- International Schools on Smart Nanomaterials IWSN (**2014, 2018**) (Kaliningrad, Rostov, Russia)
- NIS colloquium «Cu-based zeolites, versatile materials for redox catalysis» **2018** (Turin, Italy)