

Curriculum Vitae

PERSONAL INFORMATION

Name and surname **Mirta Herak**
Academic title PhD
Year and institution 2009. University of Zagreb, Faculty of Science
of PhD obtained
Address Institute of Physics, Bijenička c. 46, HR-10000 Zagreb
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Citizenship Croatian

WORK EXPERIENCE

Date (from – until) 18.01.2012. -
Institution Institute of Physics, Zagreb, Croatia
Position Scientific associate
Work field *Condensed matter physics, low-dimensional and frustrated magnets*

Date (from – until) 01.03.2011. - 01.03.2012.
Institution Institute Jožef Stefan, Ljubljana, Slovenia
Position Postdoc
Work field *Condensed matter physics, magnetic resonance techniques*

Date (from – until) 01.12.2009. - 17.01.2012.
Institution Institute of Physics, Zagreb, Croatia
Position Senior assistant
Work field *Condensed matter physics, magnetism*

Date (from – until) 17.11.2003. - 30.11.2009.
Institution Institute of Physics, Zagreb, Croatia
Position Assistant
Work field *Condensed matter physics, magnetism*

Date (from – until) 14.01.2002. - 16.11.2003.
Institution Institute of Physics, Zagreb, Croatia
Position Junior assistant
Work field *Condensed matter physics, magnetism*

EDUCATION

Date 05.11.2009.
Place Zagreb, Croatia
Institution University of Zagreb, Faculty of Science and Mathematics
Title of qualification *PhD in condensed matter physics*
awarded

Date 03.12.2001.
Place Zagreb, Croatia
Institution University of Zagreb, Faculty of Science and Mathematics
Title of qualification awarded B.Sc. in physics

TRAINING

Year 2011.-2012.
Place Ljubljana, Slovenia
Institution Jožef Stefan Institute
Subject and skills covered Experimental physics of condensed matter, electron spin resonance technique, quasi-one-dimensional spin systems

Year 2003.-2010.
Place Zagreb, Croatia
Institution Institute of Physics
Subject and skills covered Experimental physics of condensed matter, static magnetic techniques: magnetic susceptibility and torque magnetometry;
subject: magnetic anisotropy, low-dimensional magnets, defects, exchange interaction, magnetic ordering, magnetic domains, strongly correlated magnetic systems

LANGUAGES

MOTHER TONGUE **Croatian**
ENGLISH LANGUAGE
Speaking Very good
Writing Very good
Reading Very good

OTHER FOREIGN LANGUAGES

Language **Slovenian**
Speaking Basics
Writing Good
Reading Good

RESEARCH AND OTHER PROJECTS

Principal investigator/project leader:

- 01.01.2017.- COGITO project *Theoretical and experimental research of magnetic and multiferroic materials*, PIs: M. Herak (Institute of Physics- IF) i X. Rocquefelte (Institut des Sciences Chimiques de Rennes - ISCR, France); associates: M. Dragičević (IF), D. Žilić (IRB), W. Lafargue-dit-Hauret (ISCR), Boris Leguennic (ISCR), Mikaël Kepenekian (ISCR).
- 01. 06. 2015. –30. 05. 2018. Installation grant awarded by the Croatian Science Foundation: UIP 2014-09-9775. Project Title: *Influence of Magnetic Anisotropy on Quantum Spin Systems*, PI: Mirta Herak (Institute of Physics), associate: Ivana Levatić (Institute of Physics), Martina Dragičević (Institute of Physics), Dijana Žilić (Ruđer Bošković Institute), Zoran Džolić (Ruđer Bošković Institute)
- 01.05.2014. – 31. 12. 2015. Bilateral project between Croatia and Slovenia *Key Role of Magnetic Anisotropy in Low-Dimensional Spin Systems*, PI: Mirta Herak (HR - Institute of Physics) and Andrej Zorko (SLO- Jožef Stefan Institute -JSI), associates: Ivica Živković (Institute of Physics), Vinko Šurija (Institute of Physics), prof. dr. Denis Arčon (Jožef Stefan Institute - JSI), dr.sc. Andrej Zorko (JSI), dr. sc. Matej Pregelj (JSI), Anton Potočnik

(JSI), Matjaž Gomilšek (JSI); funded by the Croatian Ministry of Science, Education and Sports

- 01.03.2011.-01.03.2012. Postdoc grant *Study of magnetic order in spin chain system CuSe₂O₅ using magnetic resonance techniques*, PI: Mirta Herak, associates: prof. dr. Denis Arčon (Jožef Stefan Institute - JSI), dr.sc. Andrej Zorko (JSI), dr. sc. Matej Pregelj (JSI), Anton Potočnik (JSI); funded by the Croatian Science Foundation

Associate:

- 01.01.2015.-31.12.2016. Bilateral project with Germany funded by DAAD and Croatian Ministry of Science, Education and Sports, Project title: *Magnetic response of paired electron crystal*, PI: Tomislav Ivek (Institute of Physics), prof. dr. sc. Martin Dressel (1. Physikalisches Institut, Universität Stuttgart, Njemačka – Uni Stu), associates: M. Herak (Institute of Physics) Dr. Yuan Yan (Uni Stu), Anja Loehle (Uni Stu), Michael Slota (Uni Stu).
- 2012.-2014. Installation grant *Complex Magnetic Systems*, PI: dr.sc. Ivica Živković (Institute of Physics -IF), associates: dr.sc. Mirta Herak (IF), dr. sc. Tomislav Ivek (IF), funded by Croatian Science Foundation
- 2007.-2013. Croatian Ministry of Science, Education and Sports (CMSES) project *Defects and exchange interactions in low-dimensional (D<3) magnetic systems*, PI: dr.sc. Marko Miljak (IF) and dr.sc. Đuro Drobac (IF), associate: dr.sc. Mirta Herak (IF), funded by Croatian Ministry of Science, Education and Sports
- 2005.-2007. Scientific co-operation between Eastern Europe and Switzerland (SCOPES) project *Sparsely connected antiferromagnets: ground states, clusters and domains*, PIs: dr.sc. Mladen Prester (IF), Oksana Zaharko (Paul Scherrer Institute, Switzerland), associates: dr.sc. Marko Miljak, Mirta Herak, funded by the Swiss National Science Foundation
- 2002.-2006. Croatian Ministry of Science, Education and Sports project *Transport and thermodynamics of new materials with electron correlations*, PI: dr.sc. Veljko Zlatić, associates: dr. sc. Marko Miljak, dr. sc. Berislav Horvatić, Mirta Herak, funded by Croatian Ministry of Science, Education and Sports.

PUBLISHED PAPERS

18 papers published in journals indexed in WoSCC, >130 citations, h-index: 7.

1. D. Žilić, D. Maity, M. Cetina, K. Molčanov, Z. Džolić, and M. Herak, *Magnetostructural Characterization of Oxalamide Dihalo-Bridged Copper Dimers: Intra- and Interdimer Interactions Studied by Single-Crystal Electron Spin Resonance Spectroscopy*, **ChemPhysChem** 18, 2397 (2017).
2. A. Zorko, M. Herak, M. Gomilšek, J. van Tol, M. Velazquez, P. Khuntia, F. Bert, and P. Mendels, *Symmetry Reduction in the Quantum Kagome Antiferromagnet Herbertsmithite*, **Physical Review Letters** 118, 017202 (2017).
3. M. Pregelj, O. Zaharko, M. Herak, M. Gomilšek, A. Zorko, L. C. Chapon, F. Bourdarot, H. Berger and D. Arčon, *Exchange anisotropy as mechanism for spin-stripe formation in frustrated spin chains*, **Physical Review B** 94, 081114(R) (2016).
4. M. Herak, D. Žilić, D. Matković Čalogović and H. Berger, *Torque magnetometry study of magnetically ordered state and spin reorientation in the quasi-one-dimensional $S = 1/2$ Heisenberg antiferromagnet CuSb₂O₆*, **Physical Review B** 91, 174436 (2015).

5. M. Herak, A. Grubišić Čabo, D. Žilić, B. Rakvin, K. Salamon, O. Milat and H. Berger, *Magnetic anisotropy of the spin tetramer system SeCuO_3 studied by torque magnetometry and ESR spectroscopy*, **Physical Review B** 89, 184411 (2014).
6. M. Herak, A. Zorko, M. Pregelj, O. Zaharko, G. Posnjak, Z. Jagličić, A. Potočnik, H. Luetkens, J. van Tol, A. Ozarowski, H. Berger, and D. Arčon, *Magnetic order and low-energy excitations in the quasi-one-dimensional antiferromagnet CuSe_2O_5 with staggered fields*, **Physical Review B** 87, 104413 (2013)
7. I. Živković, D. M. Djokić, M. Herak, D. Pajić, K. Prša, P. Pattison, D. Dominko, Z. Micković, D. Cinčić, L. Forro, H. Berger, and H. M. Ronnow, *Site-selective quantum correlations revealed by magnetic anisotropy in the tetramer system SeCuO_3* , **Physical Review B** 86, 054405 (2012)
8. M. Herak, A. Zorko, D. Arčon, A. Potočnik, M. Klanjšek, J. van Tol, A. Ozarowski, and H. Berger, *Symmetric and antisymmetric exchange anisotropies in quasi-one-dimensional CuSe_2O_5 as revealed by ESR*, **Physical Review B** 84, 184436 (2011)
9. Mirta Herak, *Cubic magnetic anisotropy of the antiferromagnetically ordered Cu_3TeO_6* , **Solid State Communications** 151, 1588 (2011)
10. Mirta Herak, Marko Miljak, G. Dhalenne and A. Revcolevschi, *Easy plane anisotropy in Bi_2CuO_4* , **Journal of Physics: Condensed Matter** 22, 026006 (2010)
11. Ana Akrap, Vladan Stojanović, Mirta Herak, Marko Miljak, Neven Barišić, Helmuth Berger and Laszlo Forro, *Transport and magnetic properties of BaVSe_3* , **Physical Review B** 78, 235111 (2008)
12. Marko Miljak, Mirta Herak, Ognjen Milat, Nenad Tomašić and Helmuth Berger, *The magnetic state of the low dimensional CuTe_2O_5 compound below 20 K*, **Journal of Physics: Condensed Matter** 20, 505210 (2008)
13. Mirta Herak, Marko Miljak, Ana Akrap, Laszlo Forro, and Helmuth Berger, *Magnetic Anisotropy of Paramagnetic and Ferromagnetically Ordered State of Single Crystal BaVSe_3* , **Journal of the Physical Society of Japan** 77, 093701 (2008)
14. M. Miljak, R. Becker, M. Herak, M. Prester, O. Milat, M. Johnsson and H. Berger, *A new modification of nickel selenite NiSeO_3 - crystal structure and magnetic properties*, **Journal of Physics: Condensed Matter** 19, 196203 (2007)
15. Richard Becker, Mats Johnsson, Helmuth Berger, Mladen Prester, Ivica Živković, Đuro Drobac, Marko Miljak and Mirta Herak, *Crystal Structure and magnetic properties of $\text{Co}_7(\text{TeO}_3)_4\text{Br}_6$ - a new cobalt tellurite bromide*, **Solid State Sciences** 8, 836 (2006)
16. Richard Becker, Helmuth Berger, Mats Johnsson, Mladen Prester, Željko Marohnić, Marko Miljak and Mirta Herak, *Crystal structure and magnetic properties of $\text{Co}_2\text{TeO}_3\text{Cl}_2$ and $\text{Co}_2\text{TeO}_3\text{Br}_2$* , **Journal of Solid State Chemistry** 179, 836 (2006)
17. M. Herak, H. Berger, M. Prester, M. Miljak, I. Živković, O. Milat, Đ. Drobac, S. Popović and O. Zaharko, *Novel spin lattice in Cu_3TeO_6 : an antiferromagnetic order and domain dynamics*, **Journal of Physics: Condensed Matter** 17, 7667, (2005)
18. M. Miljak, M. Herak, A. Revcolevschi and G. Dhalenne, *Anisotropic spin-Peierls state in the inorganic compound CuGeO_3* , **Europhysics Letters** 70(3), 369, (2005)

INVITED TALKS

- M. Herak, *Sniženje simetrije u kvantnom kagome antiferomagnetu herbertsmititu*, 10. Scientific Meeting of Croatian Physical Society, Baška na Krku 2017.
- M. Herak, *Magnetska anizotropija izotropnih Heisenbergovih antiferomagneta s bakrovim spinom $S=1/2$* , 7. Scientific Meeting of Croatian Physical Society, Primošten 2011.

TEACHING

2012. Assistant in Practicum of Modern Physics, graduate course for 4. year students of physics, University of Zagreb, Faculty of Science and Mathematics

2004.-2010. Assistant in Physics Practicum I and II, undergraduate course for 1st and 2nd year students of physics, University of Zagreb, Faculty of Science and Mathematics

2001.-2012. Assistant in Physics Practicum for chemists, undergraduate course for 1st and 2nd year students of chemistry, University of Zagreb, Faculty of Science and Mathematics

MENTORSHIP OF DEFENDED DOCTORAL AND MASTER DISSERTATIONS AND TRAINING OF YOUNG RESEARCHERS AND SCIENTISTS

Mentor of diploma/master thesis:

- 2017. Željko Rapljenović, master's thesis Antiferromagnetically ordered state in spin tetramer system $SeCuO_3$, Thesis defended on 24. 07. 2017., University of Zagreb, Faculty of Science (mentor: Mirta Herak).
- 2013. Antonija Grubišić Čabo, master's thesis magnetic anisotropy of spin tetramer system $CuSeO_3$, Thesis defended on 20. 09. 2013., University of Zagreb, Faculty of Science (mentor: Mirta Herak).

Mentor of undergraduate seminars:

2012.-2013. Antonija Grubišić Čabo, *Magnetic anisotropy of bromine bridged copper dimers in $[CuL(m-Br)]_2$ ($L = N-(L-leucine\ methyl\ ester) -N'-((2-pyridin-2-yl)methyl)oxalamide$ studied by torque magnetometry*, seminar within graduate course *Independent seminar in research in physics* (mentor: Mirta Herak)

Mentor of postgraduate seminars:

2017. Marko Kuveždić, *Symmetry of antiferromagnetic state in $SeCuO_3$* , seminar within postgraduate course *Experimental research in condensed matter physics I and II*, mentor: Mirta Herak.

2015. Filip Orbanić, *Magnetic susceptibility anisotropy measured by torque*, seminar within postgraduate course *Experimental research in condensed matter physics I and II*, mentor: Mirta Herak.

2011. Matija Čulo, *Magnetic anisotropy of copper (II) selenide*, seminar within postgraduate course *Experimental research in condensed matter physics*, mentor: Mirta Herak.

VISITS TO FOREIGN RESEARCH AND EDUCATION INSTITUTIONS

01.03.2011. - 01.03.2012. Jožef Stefan Institute, Laboratory for pulsed electron paramagnetic resonance, postdoctoral stay.

AWARDS AND RECOGNITIONS

01.03.2011. - 01.03.2012. Postdoc grant by the Croatian Science Foundation

ORGANIZATIONAL SKILLS AND COMPETENCES

International science conferences and workshops:

- NATO Advanced Research Workshop on Concepts in Electron Correlation, 29.09. - 3.10. 2002. Hvar, Croatia, Organizer: Veljko Zlatić, coorganizer: Mirta Herak
- 2nd Hvar school on Strongly Correlated Electron Systems, 03.10.-08.10.2002. Hvar, Croatia, Organizer: Veljko Zlatić, coorganizer: Mirta Herak

Organization of home science events:

22.03.2013. Open day of the Institute of Physics, Zagreb, Croatia, organizer: Mirta Herak

MEMBERSHIP IN SCIENCE ORGANIZATIONS AND BODIES

Member of Croatian Physical Society.

Member of European Physical Society.

COMPUTER SKILLS

- Experienced user of Windows operating system
- Experienced user of Mathematica software
- Experienced user of Origin software
- Experienced user of ATOMS Shape software for visualization of crystal structure
- Experienced programmer in Visual Basic.net
- Experienced user of Windows Office, OpenOffice, LaTeX, MiKTeX
- Programming skills: Mathematica, VB.net, Quickbasic

OTHER IMPORTANT SKILLS AND COMPETENCES

- Experienced user of cryogenic liquids (nitrogen and helium) in experiment
- Experienced user of electromagnets and high dc current power supplies
- Experienced user of high vacuum pumps
- Experienced user of high precision measuring instruments (microbalance)
- Experience in experimental setup for static magnetic measurements
- Experience in computer controlled measurements and programming
- Experience in shaping of quartz for sample holders
- Experienced user of low frequency electron spin resonance techniques (X and Q-band)
- Some experience in use of high magnetic fields and superconducting magnets

ADDITIONAL INFORMATION AND NOTES

Secretary of the Croatian Physical Society (2013.-2014.)