



**Univerzitet Crne Gore**  
**Prirodno-matematički fakultet**

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Broj:

1024/02-426

Datum:

22.02.2024.god

**UNIVERZITET CRNE GORE**  
**SENATU**  
**CENTRU ZA DOKTORSKE STUDIJE**

U prilogu akta dostavljamo Predlog Odluke o imenovanju komentora i mentora sa CII sjednice Vijeća PMF-a održane 12.07.2023. godine,

S poštovanjem





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Broj:

1022/01-1210/2

Datum:

07.07.2023.god

Na osnovu člana 64 Statuta Univerziteta Crne Gore, a u vezi sa članom 29 stav 1 Pravila studiranja na doktorskim studijama Univerziteta Crne Gore, na CII sjednici održanoj 12.07.2023.godine, Vijeće je donijelo

**ODLUKU**

I

Predlažemo Centru za doktorske studije Univerziteta Crne Gore prof. dr.Jovana Mirkovića, redovnog profesora na Prirodno-matematičkom fakultetu za mentora i dr. Abdelrahima Hassaniena za komentora studentu doktorskih studija - studijski program Fizika – Stefanu Šćepanoviću.

II

Dokumentacija o ispunjenosti uslova za imenovanje mentora i Potvrda o studiranju Stefana Šćepanovića predstavljaju sastavni dio odluke.

III

Odluka se dostavlja Senatu i Odboru za doktorske studije.



## MENTORSTVO

IME I PREZIME KANDIDATA		Stefan Šćepanović	
<b>PREDLOŽENI MENTOR/I</b>			
	Titula, ime i prezime	Ustanova i država	Naučna oblast
Prvi mentor	Prof.dr Jovan Mirković	Prirodno-matematički fakultet, UCG, Crna Gora	Fizika čvrstog stanja
Drugi mentor	Prof. dr Abdou Hassanien	Institut „Jožef Štefan“ Slovenija	Fizika kondenzovanog stanja
Sjednica Vijeća organizacione jedinice na kojoj je izvršeno predlaganje mentora		12.07.2023. godine	
<b>KOMPETENCIJE MENTORA</b> (u skladu sa članom 29 Pravila doktorskih studija)			
Prvi mentor	1	Jovan Mirkovic, Alexandre I. Buzdin, Takanari Kashiwagi, Takashi Yamamoto, Kazuo Kadowaki. Crossover from crossing to tilted vortex phase in Bi2Sr2CaCu2O8+d single crystals near ab-plane. Physica C: Superconductivity and its Applications, 2013, 484, pp.77-80.	
	2	J. Mirkovic, T. Kashiwagi, T. Saito, T. Yamamoto, K. Kadowaki / Geometry dependent resistivity behavior in mesoscopic Bi2Sr2CaCu2O8+d single crystals // Physica C 471 (2011) 787-789.	
	3	S.E. Savel'ev, J. Mirković, and K. Kadowaki / The London theory of crossing-vortex lattice in high anisotropic layered superconductors // Phys. Rev. B, Vol. 64, 94521 (2001).	
	4	J. Mirković, K. Kimura and K. Kadowaki / Moving Vortex States Studied by Current Flow in Single Crystal Bi2Sr2CaCu2O8+d // Phys. Rev. Lett. Vol. 82, 2374 (1999).	
	5	Jovan Mirković and Kazuo Kadowaki / Vortex Dynamics in Low Magnetic Fields in Single Crystal Bi2Sr2CaCu2O8+d/ Physica C, v. 341-348 pp. 1273 (2000).	
Drugi mentor	1	Alexander Vahl, Niko Carstens, Thomas Strunskus, Franz Faupel & Abdou Hassanien / Diffusive Memristive Switching on the Nanoscale, from Individual Nanoparticles towards Scalable Nanocomposite Devices/ Scientific Reports, Vol 9, 17367 (2019)	
	2	Niko Carstens, Alexander Vahl, Ole Gronenberg, Thomas Strunskus, Lorenz Kienle, Franz Faupel, and Abdou Hassanien/ Enhancing Reliability of Studies on Single Filament Memristive Switching via an Unconventional cAFM Approach // Nanomaterials 2021, 11(2), 265;	
	3	Carstens, N., Strunskus, T., Faupel, F., Hassanien, A., Vahl, A., Neuronal-like Irregular Spiking Dynamics in Highly Volatile Memristive Intermediate-scale AgPt-Nanoparticle Assemblies. Part. Part. Syst. Charact. 2023, 40, 2200131. <a href="https://doi.org/10.1002/ppsc.202200131">https://doi.org/10.1002/ppsc.202200131</a>	
	4	Hassanien, A. / Smeared d-Wave Anisotropy in a Monolayer Organic Superconductor // Adv. Electron. Mater. 2019, 5, 1800247. <a href="https://doi.org/10.1002/aelm.201800247">https://doi.org/10.1002/aelm.201800247</a>	



	5	Hassanien, A. / Tunable Flat Band in Large-Scale Kagome Lattice of Single Layer (BETS) $2\text{GaC}_{14}$ // Phys. Status Solidi B, 256: 1900346. (2019) <a href="https://doi.org/10.1002/pssb.201900346">https://doi.org/10.1002/pssb.201900346</a>
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**PODACI O MAGISTRANDIMA I DOKTORANDIMA**

	Broj magistranada		Broj doktoranada	
	trenutno	ukupno	trenutno	ukupno
Prvi mentor	1	2	1	1
Drugi mentor		1	1	8

**Datum i ovjera (pečat i potpis odgovorne osobe)**

U Podgorici  
7.06.2023.



*[Handwritten signature]*  
DEKAN

Broj 2023/01-210/1

Podgorica, 07. 07. 2023 god.



**MOLBA ZA IMENOVANJE MENTORA  
IZ REDA NASTAVNIKA ILI NAUČNIH  
SAVJETNIKA/SARADNIKA UCG**

*stud. 2022/23. god.*

<b>fakultet / institut</b>	Prirodno-matematički fakultet	
<b>studijski program</b>	fizika	
<b>student (Ime Prezime)</b>	Stefan Šćepanović	
<b>br. ind.</b>	<u>1/2022</u>	
<b>predloženi prvi mentor</b>  <i>(popuniti ako predloženi mentor nije sa fakulteta UCG na kojem je organizovan studijski program)</i>	Jovan Mirković	docent <input type="checkbox"/> vanredni prof. <input type="checkbox"/> redovni prof. <input checked="" type="checkbox"/> naučni sarad. <input type="checkbox"/> viši nauč. sarad. <input type="checkbox"/> naučni savj. <input type="checkbox"/>
	<b>fakultet / institut:</b>	
<b>predloženi drugi mentor</b>  <i>(popuniti ako predloženi mentor nije sa fakulteta UCG na kojem je organizovan studijski program)</i>	Abdou Hassanien	docent <input type="checkbox"/> vanredni prof. <input type="checkbox"/> redovni prof. <input type="checkbox"/> naučni sarad. <input type="checkbox"/> viši nauč. sarad. <input checked="" type="checkbox"/> naučni savj. <input type="checkbox"/>
	<b>fakultet / institut:</b> Institut "Jožef Stefan", Ljubljana, Slovenija	
Datum: <b>5. 7. 2023</b>	Molbu podnosi student: <i>(potpis)</i>	
	Sa molbom saglasan prvi mentor:	
	Sa molbom saglasan drugi mentor:	



datum: 20.12.2023

## POTRDILO O ZAPOSLOTITVI

Potrjujemo, da je dr. Abdelrahim Ibrahim Hassaniien zaposlen na Institutu »Jožef Stefan«, Jamova cesta 39, 1000 Ljubljana od 9. 6. 2014 dalje in je zaposlen za nedoločen čas s polnim delovnim časom.

Mateja Meden Šerbelj  
Sekretariat IJS



PERSONAL AND CONFIDENTIAL

Zewail City of Science and Technology hereby appoints Dr. Abdou Hassanien as a Full Professor at the University of Science and Technology and Director of the Center for Nano Technology (CNT) effective August 1, 2015. The Appointee will directly report to the Vice Chair for Academic Affairs. This is a 2 years contract, which can be renewed pending evaluation of teaching, research and services to the City.

- 1- The Appointee agrees to lead the development of the Center for Nano Technology (CNT), and to teach courses in his field of competence as needed at the University of Science and Technology. Appointee agrees as well to perform other departmental activities pertinent to the academic profession, such as, committee assignments, student advising and appropriate administrative duties.
- 2- For compensation of the Appointee's services, Zewail City will provide an annual net salary of 456,000 EGP, paid on 12 installments.
- 3- Tuition is provided for children of the Appointee who is academically qualified for admission to the University of Science and Technology.
- 4- Appointee and his Spouse and children are entitled to 50 % coverage for medical insurance . The other 50% will be deducted from Appointee's monthly pay. Enrollment is only possible during the first month in service.
- 5- In conformity with the Social Insurance Regulations, Zewail City is required to issue a check payable to the Social Insurance Authority covering Appointee's and Zewail City's social insurance contributions. It is important to note that both contributions are based on the appointee's gross monthly salary in accordance with Social Insurance Law.
- 6- It is agreed that this document constitutes the entire agreement between Zewail City of Science and Technology and the Appointee.
- 7- In case of resignation the Appointee is required to give an advance 2 months notice, the end of service will be complete when he or she performs a complete handover that includes ongoing projects, return of all City's assets and providing all accumulated documents in soft/hard copy format, as requested by the Vice Chair for Academic Affairs office.
- 8- If the terms of this agreement are acceptable, the Appointee should sign all copies, retain one, and return the other to the office of the Vice Chair for Academic Affairs office.

Vice Chair for Academic Affairs

Name: Salah Obayya  
Signature: [Signature]  
Date: 18.06.2015

I hereby confirm that I accept this contract and its terms.

Appointee Name: Abdou Hassanien  
Signature: \_\_\_\_\_  
Date: 18.06.2015

[Signature]  
Hassanien

## CIRRCULUM VITAE

- Name: Abdelrahim Hassanien
  - Current Institution: Jozef Stefan Institute, Ljubljana, Slovenia
  - Address: Murnikova 5, SI-1000 Ljubljana
  - Cell no.: +386-41-299956
  - Email: [abdou.hassanien@ijs.si](mailto:abdou.hassanien@ijs.si) or [abdou.hassanien@gmail.com](mailto:abdou.hassanien@gmail.com)
  - Highest academic position: Full Professor, Director of Center of Nanotechnology
  - Field of research: Condensed matter Physics
  - Focused research area: Nanoscience
  - H-index: 15 in 37 refereed publications with 899 citations  
( <http://www.scopus.com/authid/detail.url?origin=AuthorProfile&authorId=55936393200&zone=>)
- Most cited article in Nature Nanotechnology 2007 with 245 citations.

### Education:

Nov. 1996-May 1997

Post-doctoral fellow at NCSR Demokritos Athens, Greece.

*Research Theme:* atomic force microscopy and spectroscopy of cement hardening process in collaboration with TITAN cement company in Athens, Greece.

*Host:* Prof. Dr. Fani Milia.

Oct. 1992- Oct. 1996

Ph.D. in Physics, University of Ljubljana, Slovenia

*Research Subject:* Photo-structural properties epitaxial C<sub>60</sub> thin films. Molecular resolved properties by scanning probe technique (SPM), transport in TDAE- C<sub>60</sub> thin films. High quality epitaxial growth of fullerenes thin film.

*Thesis advisor:* Prof. dr. Dragan Mihailovic

*Title:* Transport and structural properties of some fullerenes compounds.

Sept. 1991-Sept 1992

Diploma in Theoretical condensed Matter Physics, Abdus Salam international center for theoretical physics, Trieste, Italy.

*Research subject:* Condensed Matter Physics, surface science, chemisorption of metal atoms on surfaces.

*Thesis advisor:* Prof. dr. Vijay Kumar

*Title:* Chemisorptions of Ni on Cu surfaces.

Sept. 1988- May. 1991

M.Sc. in condensed matter physics, University of Ain Shams, Cairo Egypt.

*Research subject:* Solid State Physics, Chalcogenide glasses, kinetics of amorphous semiconductors phase change versus external impacts such as heat



Host: Prof. Esko Kauppinen and Prof. Peter Liljeroth department of applied Physics, Aalto University, Finland.

Research Theme: Proximity effect of d-wave superconductors, Charge transport in carbon nanotube thin film transistor.

Jan 2017- Dec 2017 (funded by Collaborative Research Center (SFB), 677)

**Visiting Professor, Kiel University, Kiel Germany.**

Host: Prof. Franz Faupel, Institute for material Science, Kiel University.

Research Theme: Nanoscale mapping of Light harvesting metamaterials.

Oct. 2011 - Oct. 2012:

**Visiting Senior researcher at Aalto University, Espoo, Finland.**

*Research themes:* Structure and electronic properties of active carbon nanotube

devices; effect of network morphology on transport properties of carbon nanotube thin film transistor. We also have employed a new technique that combined STM or AFM with HRTEEM to characterized interface properties and their effect on Schottky barrier height. We studied the effect of carbon nanotube contacts on transport properties and performance of thin film transistor.

Major achievement: We have fabricated highly sensitive carbon nanotube thin film transistors and studied the microscopy of contacts and doping effects. The study provided a valuable information on the mechanism of single molecule detection. (Nano Res. 2012, Journal of Chemical Physics C, 2013).

Host: Prof. Esko Kauppinen

Sept. 2007- July 2009

**Visiting Professor at Ohio University, Ohio, USA.**

*Research themes :* Molecular scale organic superconductivity and dielectric properties of single wall carbon nanotubes.

Major achievement:

1. *Nanoscale confined superconducting condensate:*

We have fabricated the world smallest superconductor which is just 4 molecular pairs. This discovery opens up a great opportunity to test theories in a clean system thereby unraveling the mechanism and the nature of superconductivity right at the nanoscale.

2. *Assaying metallic and semiconducting nanotubes at room temperature:*

We have built a facile and fast technique to assay metallic and semiconducting nanotubes based on their dielectric response. We improve techniques further to include gating effects for application in carbon nanotube thin film transistors

Senior research Scientist  
Jozef Stefan Institute, Department of Condensed Matter Physics, Slovenia

**Research Interest**  
Scaling and proximity effects in single layer mesoscopic superconductors, Organic charge transfer salts, gating actions in gas and biomolecule sensors, atom and molecule manipulations, flexible electronics, interconnects technology, single molecule functionalization.

**December 2015-May 2016.**  
Professor and Director of Center for Nanotechnology, Zewail City of Science and Technology, Giza, Egypt.

**Research Interest:**  
Microfabrication of flexible nanotube thin film transistor, Nanoscale characterization of catalytic activity, Spatial resolved photovoltaic properties, Biosensors. Near field scanning probe microscopy for mapping nanoscale optical and electrical properties.

**Press release:**  
High resolution imaging of carbon nanotubes at room temperature, AIST  
(1999) Selective etching of single wall carbon nanotubes, AIST (2005)  
The world smallest superconductor is just 3.5 nm, AIST (2010)

### **Participation in funded Japanese and European projects:**

**August 2010-2013:**  
I have been involved in center of excellence for low carbon technology (CO NOT project) to develop highly efficient energy storage devices. The total funds amounts to 10 million Euros.

**April 2004-March 2008**  
I have been involved in CREST-JST project. A national initiative from the Japanese government to promote basic research on nanomaterials. (Total funds more than 35 million dollars).

**April 2002-March 2006**  
I have been involved in NEDO nanocarbon project. A national initiative from Japanese government to promote basic and applied research of carbon nanotubes and related materials. The project involves about 8 companies (Fujitsu, Mitsubishi, NEC,...etc) and 10 universities around the country. The project leader was Prof. sumio Iijima who has discovered the nanotubes in 1991. (total funding more than 35 million dollars).

**April 2003-March 2005**  
Slovenia Japan bilateral project. In collaboration with Dr. Venturini & Prof. Dr. Dragan Mihailovic. To investigate the atomic scale properties of dichalcogenide and carbon nanotubes (50, 000 US\$)

- Hassanien (**invited talk**)  
 "Heteroepitaxial Patterning of  $(\text{BETS})_2\text{GaCl}_4$  on Ag(111): from Kagome Lattice to Monolayer Superconductor"  
 National Institute of Material Science (NIMS), Tsukuba, Japan (21/1/2015).
- A. Hassanien (**invited talk**)  
 International Workshop Advances in nanostructured superconductors: materials, properties and theory "La Cristalera", Miraflores de la Sierra, Madrid, 4 - 7 May (2014).
- Hassanien (**invited talk**)  
 Heteroepitaxial growth of organic superconductor on Ag(111)  
 Aalto University, Espoo, Finland(13/6/2014).
- Hassanien (**oral Contribution**)  
 International conference on "Physics and Applications of Superconducting Hybrid Nano-Engineered Devices" (SHyNeD 2014) Santa Maria di Castellabate, Italy, 31 August to 4 September 2014.
- Hassanien (**invited talk**)  
 "Gating action in carbon nanotube thin film transistor"  
 Kent State University, Kent, USA (8/1/2014)
- Hassanien (**invited talk**)  
 "Proximity in nanoscale superconductors"  
 Aalto University, Espoo, Finland (12/12/2013).
- Hassanien (**invited talk**)  
 "Gating action in carbon nanotube thin film transistor"  
 Espoo, Aalto University 13/12/2013.
- Hassanien (**Oral Contribution**)  
 "Spatially Resolved Transport Properties of Pristine and Doped Single-Walled Carbon Nanotube Networks"  
 Espoo and Tallinn, NT13, 29/6/2013 (Finland and Estonia)
- Hassanien (**invited talk**)  
 "Scaling Effects in Mesoscopic Conductors and superconductors" Florida, ICSS, 17/12/2012, (USA)
- Hassanien (**two invited talks**)  
 "Superconductivity at nanoscale" & "spatially resolved electronic properties on mesoscopic materials"  
 Marsa Alam, Eg-MRS, 27/11/2012, (Egypt)
- Hassanien (**invited talk**)  
 "Optimizing the microstructure of Carbon Nanotube thin film transistor for sensing applications"  
 Shenzhen, Nanomedicine, 2/11/2012 (China)
- Hassanien (**invited talk**)

- P. Umek, A. **Hassanien**, M. Tokumoto, D. Mihailovic. *Carbon*, 38: (11-12) 1723-1727 (2000).
6. "Scanning tunneling microscopy and spectroscopy study of carbon nanotubes"  
A. **Hassanien** and M. Tokumoto; *Molecular Materials*, 13: (1-4) 51-58 (2000).
  7. "Doping mechanism in single-wall carbon nanotubes studied by optical absorption" R. Jacquemin, S. Kazaoui, D. Yu, A. **Hassanien**, N. Minami, H. Kataura, Y. Achiba. *Synthetic metals* 115: (1-3) 283-287 (2000).
  8. "Atomically resolved scanning tunneling microscopy and spectroscopy of carbon nanotubes" A. **Hassanien**; *Proceeding of nanotubes& nanostructures, Sardinia Italy* (2000).
  9. "Fermi electron wave packet interference images on carbon nanotubes at room temperature" A. **Hassanien**, M. Tokumoto, P. Umek, D. Mihailovic and A. Mrzel *Applied Physics. Letters*. 78, 808 (2001).
  10. "STM of short Multiwall Carbon nanotubes" A. **Hassanien**, M. Tokumoto, X. Zhao and Y. Ando. *Synthetic metals* 121: (1-3) 1197-1198 (2001).
  11. "Interference of Electron Waves on Carbon Nanotubes at Room Temperature" A. **Hassanien**, P. Umek, D. Vrbanic, M. Mozetic, P. Venturini, M. Tokumoto, D. Mihailovic, and S. Pejovnik, *MRS Proceedings Volume 706* (2001)
  12. "Scanning tunneling microscopy of aligned coaxial nanowires of polyaniline passivated carbon Nanotube" A. **Hassanien**, M. Gao, M. Tokumoto and L. Dai; *Chem. Phys. Lett* 342 (5-6): 479-484 (2001).
  13. "Charge density modulation on single wall carbon nanotube at room temperature" A. **Hassanien**, P. Umek, A. Mrzel, D Vrbanic, Mozetic, P. Venturini, M. Tokumoto, D. Mihailovic and S. Pejovnik. *Electronic properties of molecular nanostructures, Kirchberg, Austria. AIP Conf. Proc.* 591(1) 359 (2001).
  14. "Scanning tunneling microscopy of aligned coaxial nanowires of polyaniline passivated carbon nanotube"  
A. **Hassanien**, M. Gao, M. Tokumoto and L. Dai. *Electronic Properties of Molecular Nanostructures: XV International Winterschool/Euroconference Kirchberg, Tirol (Austria) AIP Conf. Proc.* 591(1) 501 (2001).
  15. "Imaging the interlayer interactions of multiwall carbon nanotubes using scanning tunneling microscopy and spectroscopy"

- Shandakov, Giulio Lolli, Daniel E. Resasco, Mansoo Choi, David Tománek, and Esko Kauppinen. *Nature Nanotechnology* 2(3), 156-161 (2007).
27. "Effective, fast, and low temperature encapsulation of fullerene derivatives in single wall carbon nanotubes" A. Mrzel, **A. Hassanien**, Z. Liu, K. Suenaga, Y. Miyata, K. Yanagi, H. Kataura. *Surface Science* 601 5116–5120 (2007).
28. "Carbon nanotube metrology" A. Jorjo, E. Kaupinnen, **A. Hassanien** book chapter published in *Carbon Nanotubes: Advanced Topics in the Synthesis, Structure, Properties and Applications*. Edited by Mildred Dresselhaus, Gene Dresselhaus and Ado Jorio (2007).
29. "The Local-scale Study of a NanoBud Structure" Ying Tian, Delphine Chassaing, Albert G. Nasibulin, Paola Ayala, Hua Jiang, Anton S. Anisimov, **Abdou Hassanien**, Esko I. Kauppinen, *Physica Status Solidi* 245, 2047 (2008).
30. "A Scanning Probe Microscopy Based Assay for Single-Walled Carbon Nanotube Metallicity" W. Lu, Y. Xiong, **A. Hassanien**, W. Zhao, M. Zheng and L. Chen, *Nano Letters*, 9, 1668-1672 (2009).
31. "Superconductivity in Just Four Pairs of (BETS)<sub>2</sub>-GaCl<sub>4</sub> Molecules" K. Clark, **A. Hassanien**, S. Khan, K.-F. Braun, H. Tanaka, and S.-W. Hla, *Nature Nanotechnology*, 5, 261 – 265 (2010).
32. "Preparation of Atomically Flat Gold Substrates for AFM Measurements" U. Maver, O. Planinsek, J. Jamnik, **A. Hassanien** and M. Gaberscek, *Acta Chim. Slov.*, 59, 212–219 (2012).
33. "Contactless Characterization of Electronic Properties of Nanomaterials Using Dielectric Force Microscopy" W. Lu, J. Zhang, Y. S. Li, Qi Chen, X. Wang, **A. Hassanien**, and L. Chen, *The journal of physical chemistry. C, Nanomaterials and interfaces*, 116, no. 12, str. 7158-7163 (2012)
34. "Effect of Carbon Nanotube Network Morphology on Thin Film Transistor Performance" M. Y. Timmermans, D. Estrada, A. G. Nasibulin, J. D. Wood, A. Behnam, D. M. Sun, Yutaka Ohno, J. W. Lyding, **A. Hassanien**, E. Pop and E. I. Kauppinen, *Nano Res.*, 5(5): 307–319 (2012).
35. "A novel facile synthesis and characterization of molybdenum nanowires" Andrej Kovič, Andrej Žnidaršič, Adolf Jesih, Aleš Mrzel, Miran Gabersček, **Abdou Hassanien**, *Nanoscale Research Letters*, 7, 567 (2012).
36. "Spatially Resolved Transport Properties of Pristine and Doped Single-Walled Carbon Nanotube Networks" Andrej Znidarsic, Antti Kaskela, Patrik Laiho, Miran Gaberscek, Yutaka Ohno, Albert G. Nasibulin, Esko I. Kauppinen and **Abdou Hassanien**, *J. Phys. Chem. C*, 117 (25), pp 13324–13330 (2013).
37. Hydrogen-Driven Cage Unzipping of C<sub>60</sub> into Nano-Graphenes" Alexandr V. Talyzin Serhiy Luzan, Ilya V. Anoshkin, Albert G. Nasibulin, Esko I. Kauppinen, Andrzej Dzwilewski, Ahmed Kreta, Janko Jamnik, **Abdou Hassanien**, Anna Lundstedt and

6. Ahmed Samy Kreta PhD student at Ljubljana University (AFM techniques on flexible and conducting nanowires, microscopic properties of Li ion batteries, 2017).

7. Tjasa Parkelj, Master student at University of Ljubljana (Low temperature UHV STM spectroscopic techniques on few layers of elemental superconductors on metal surfaces, 2015).

8. Moheb Abdelaziz, PhD students at Kiel University (Plasmonic metamaterials for solar cell applications, 2019).

9. Mehmet Yetik PhD student at Kiel University (Near-Field mapping of light harvesting metamaterials, 2021).

### **Teaching Experience:**

#### **Post graduate teaching:**

1. Solid state physics: PhD and Master Students, Ohio University 2007-2009.
2. Advanced lectures on Real space exploration of electronic and structural properties of Nanomaterials for PhD students at Tokyo Institute of technology, Tokyo, Japan (2010-2011).
3. Advanced course on nanoscale microscopy and spectroscopy for master and PhD students at Aalto University, Espoo, Finland (2011-2012).
4. Advanced course on nanoscale microscopy and spectroscopy for master and PhD students at Aalto University, Espoo, Finland (2016-2017).

#### **Undergraduate Teaching:**

1. Ain Shams University (Cairo, Egypt):  
Solid state physics 1997-1999
2. Ain Shams University (Cairo, Egypt)  
Solid state electronics: 1987-1991
3. Ohio University (Ohio, USA):  
Guest lecturer, general physics, Solid state physics 2007-2009.
4. Sultan Qaboos University (Oman), General Physics: fall semester of 2015-2016.

UNIVERSITET CRNE GORE  
PRIPROSTOR ZA PISANJE  
Podgorica, 23-11-2020 god.

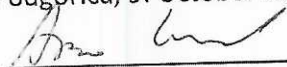
## REQUEST

TO THE FACULTY OF NATURAL SCIENCES AND MATHEMATICS

I, as a PhD student at the Faculty of Natural Sciences and Mathematics, have chosen prof. Jovan Mirković as my PhD advisor, and prof. Abdelrahim Hassanien from the Jožef Stefan Institute as my co-advisor. Therefore, I request that the Faculty propose these candidates to the Center for doctoral research.

Arso Ivanović

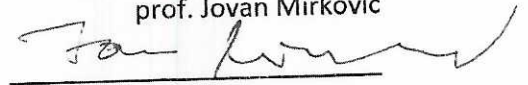
In Podgorica, 9. October 2020



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With consent from:

prof. Jovan Mirković



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prof. Abdelrahim Hassanien



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Број: 01-258  
Датум, 21.02.2008 г.

Ref: \_\_\_\_\_  
Date, \_\_\_\_\_

Na osnovu člana 75 stav 2 Zakona o visokom obrazovanju (Sl.list RCG br. 60/03.) i člana 18 Statuta Univerziteta Crne Gore, Senat Univerziteta Crne Gore, na sjednici održanoj 21.02.2008. godine, donio je

## ODLUKU O IZBORU U ZVANJE

Dr JOVAN MIRKOVIĆ bira se u akademsko zvanje redovni profesor Univerziteta Crne Gore za predmete: Osnovi fizičkog eksperimenta I i II, Istorija i filozofija fizike na Prirodno-matematičkom fakultetu i Fizika na nematičnim fakultetima.



REKTOR,

Prof.dr Ljubiša Stanković





## Europass Curriculum Vitae



### Personal information

Surname(s) / First name(s)

**Mirković Jovan**

Address(es)

University Office: Faculty of Science and Mathematics, University of Montenegro, George Washington Str. bb, 81 000, Podgorica, Montenegro

Montenegrin Science Promotion Foundation PRONA Office: Studentska, lamela 10/29, 81 000 Podgorica, Montenegro

Telephone(s)

+382 20 220 615 (office);

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[mirkovic@ucg.ac.me](mailto:mirkovic@ucg.ac.me) (office)

Nationality

Montenegrin

Date of birth

July 31, 1961

Gender

Male

### Desired employment / Occupational field

**Physics – research and education**

### Work experience

Dates

**2008 – present**

Occupation or position held

**Full professor**

Main activities and responsibilities

Education and research in physics, materials science and nanotechnologies

Teaching courses:

- Experimental Physics (Faculty of Sciences and Mathematics, Department of Physics)
- Biophysics (Department of Biology)
- History and Philosophy of Physics (Department of Physics)
- Modern Physics - Solid State Physics (Department of Physics) – Graduate School
- Automatic Data Acquisition (Department of Physics) – Graduate School
- General Physics (Faculty of Mechanical Engineering)
- Biophysics (Faculty of Medicine)
- Biophysics (School of Dental Medicine)
- Dental materials – physics contest (School of Dental Medicine)
- Physics and Philosophy (Faculty of Economics)
- The Japanese Economy (Faculty of Economics)
- Low temperature physics and superconductivity

Name and address of employer Faculty of Science and Mathematics University of Montenegro, George Washington Str. bb, 81 000, Podgorica, Montenegro

Visiting professor, Graduate School of Pure & Applied Sciences, University of Tsukuba, Japan

Type of business or sector Public sector - High Education

Dates 2005 - 2010

Occupation or position held Associate professor

Main activities and responsibilities

Teaching courses:

- Experimental Physics (Faculty of Natural Sciences and Mathematics – FNSM, Department of Physics)
- Chapters of Modern Physics - Solid State Physics (FNSM, Department of Physics) – MSc level
- Automatic Data Acquisition (FNSM, Department of Physics) – MSc level
- Physics and Philosophy (Faculty of Economics)
- The Japanese Economy (Faculty of Economics)

2003 COE 21st Century Researcher, University of Tsukuba, JAPAN;

2003-2005 Researcher, 21st Century Center of Excellence Program, University of Tsukuba

2006 Visiting Professor, University of Tsukuba, Japan

Research in Superconductivity and Nano-engineering; S&T in Montenegro; Science popularization.

Projects:

- „Theoretical and experimental investigation of thermodynamic and transport properties of superconductors Ministry of Education and Science“, Montenegro, 2005-2007,
- „Introduction to Experimental Physics“, Course development program (CDP+), WUS-Austria, 2004
- Multidisciplinary Centre for Experimental Study, WUS-Austria, 2003.

Name and address of employer Faculty of Science and Mathematics, University of Montenegro, George Washington Str. bb, 20 000, Podgorica, Montenegro

Type of business or sector Public sector – High Education

Dates 1997- 2002

Occupation or position held Assistant professor

Main activities and responsibilities

Teaching courses:

- Introduction to experimental physics (Faculty of Science and Mathematics, Department of Physics)
- Physics (Faculty of Electrical Engineering)
- Physics (Faculty of Civil Engineering)

Research in vortex dynamics of high-temperature superconductors.

1997-2000 CREST (JST) Researcher, Institute of Materials Science, University of Tsukuba

Name and address of employer Faculty of Natural Sciences and Mathematics, University of Montenegro, George Washington Str bb 81 000, Podgorica, Montenegro

Type of business or sector Public sector – High Education

Dates 1996

Occupation or position held 1996 Post-doctoral STA fellow, National Research Institute for Metals, Tsukuba, Japan

**Main activities and responsibilities** Research – experimental study of vortex dynamics in high-temperature superconductors.

**Name and address of employer** Science and Technology Agency of Japan, National research Institute for Metals, Tsukuba,  
**Type of business or sector** Public sector – Scientific Research

**Dates** 1991 - 1994

**Occupation or position held** Researcher

**Main activities and responsibilities** Research – electromagnetic properties of ceramic and melted high-temperature superconductors

**Name and address of employer** Moscow State University "M. V. Lomonosov", Faculty of Physics, Russia

**Type of business or sector** All Russian Electric Engineering Institute, Moscow, Russia

Public sector – Education and Research

**Dates** 1987-1990

**Occupation or position held** Research fellow

**Main activities and responsibilities** Teaching assistant

Teaching courses / experimental and theoretical exercises:

- Physics - Faculty of Electrical Engineering, Faculty of Civil Engineering, Faculty of Metallurgy and Technology, Faculty of mathematics and Natural Sciences – Biology Department

**Name and address of employer** Institute of Mathematics and Physics, University of Veljko Vlahovic, Montenegro,  
Cetinjski put bb, 81 000, Titograd, Montenegro

**Type of business or sector** Public sector – High Education

## Education and training

**Dates** 1996

**Title of qualification awarded** PhD in Physics

**Principal subjects/occupational skills covered** Condensed Matter Physics – High Temperature Superconductors

**Name and type of organisation providing education and training** Moscow State University "M. V. Lomonosov", Faculty of Physics, Russia

**Level in national or international classification** PhD

**Title of qualification awarded** BSc in Physics (4 years studies)

**Principal subjects/occupational skills covered** Physics

**Name and type of organisation providing education and training** Institute of Mathematics and Physics, University of Veljko Vlahovic, Titograd, Montenegro, Yugoslavia

**Level in national or international classification** BSc

**Personal skills and competences** Scientific disciplines:

- Physics
- Solid State Physics.

Specific research subjects:

- Experimental solid state physics
- Superconductivity
- Nanotechnology

Experience:

- Project Management
- Foresight analysis
- Science communication

Mother tongue(s) **Montenegrin**

Other language(s)

Self-assessment European level (*)	Understanding				Speaking				Writing	
	Listening		Reading		Spoken interaction		Spoken production			
<b>English</b>	C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user
<b>Russian</b>	C2	Independent user	C2	Independent user	C1	Independent user	C1	Independent user	B2	Independent user

(\*) Common European Framework of Reference for Languages

Social skills and competences Chairperson at scientific conferences; Montenegro team leader at the 42<sup>nd</sup> and 43<sup>rd</sup> International Physics Olympiad; Mentorships (BSc, MSc, PhD).

Organizational skills and competences President of Montenegrin Science Promotion Foundation PRONA; president of the National Committee of IAESTE; member of National UNESCO Commission; member of Board of Foundation Young Inventor Program for Montenegro; member of National Council for Cooperation of NGOs and Government; Member of Parliament of Montenegro 1985-89; President, Physics Program Committee for Public Elementary and High Schools; Long track record of science communication and work with young talents. Montenegro team leader, 42<sup>nd</sup> and 43<sup>rd</sup> International Physics Olympiad; Chairman of organizing committee of scientific conferences on nanoscience in Montenegro in 2008, 2009, 2011 and 2016; President of organizing committee of Summer Science School for Young Talents 2008-2012; Program Director of the Science Festival – Researchers' Night in Montenegro 2009 – 2015; Founder: The Japanese Corner; Astronomy Club; Science News Portal..

Computer skills and competences Computer skills:

- Operating systems: Windows
- Office Automation: MS Office (Word, Excel ...)
- Presentation skills: MS PowerPoint

Driving licence B type (car driving) since September 6, 1988

Additional information 2014-2018 The first Ambassador of Montenegro to Japan

Annexes Annex 1: Jovan Mirkovic: Bibliography  
Annex 2: Jovan Mirkovic: List of projects

## Books and Monographs

- [1] **Jovan Mirković**: „With science to the future”, chapter in the book: „Montenegro in XXI Century - in the Era of Competitiveness: Science and Technology”, Editor Jovan Mirkovic, Montenegrin Academy of Sciences and Arts, Special editions: Monographies and Studies, Volume 73, Tom 11, ISBN 978-86-7215-249-4, COBISS.CG-ID 16240400, Podgorica, 2010, p. 17-24.
- [2] **Jovan Mirković**: „Knowledge based decision-making”, chapter in the book: „Montenegro in XXI Century - in the Era of Competitiveness: Science and Technology”, Editor Jovan Mirkovic, Montenegrin Academy of Sciences and Arts, Special editions: Monographies and Studies, Volume 73, Tom 11, ISBN 978-86-7215-249-4, COBISS.CG-ID 16240400, Podgorica, 2010, p. 311-330.
- [3] Kutlača Đuro, **Jovan Mirković**, Sandra Tinaj: “Key Directions and Interdisciplinarity”, chapter in the book: “Montenegro in XXI Century - in the Era of Competitiveness: Science and Technology”, Editor Jovan Mirkovic, Montenegrin Academy of Sciences and Arts, Special editions: Monographies and Studies, Volume 73, Tom 11, pp 111-166, ISBN 978-86-7215-249-4, COBISS.CG-ID 16240400, Podgorica, 2010
- [4] **J. Mirković** and K. Kadowaki / *Dynamical Resistivity Behavior above and below Vortex Lattice Melting Transition in Single Crystalline  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  // Advances in Superconductivity XI*, p. 557, Springer, 1999 (ISBN-10: 4431702563).
- [5] Radovan Ognjanovic, **Jovan Mirkovic**, “Selected Topics of Physics”, The Institute for textbooks and educational teaching resources, Podgorica, Montenegro, 2012, ISBN 978-86-303-1721-7.

PhD Dissertation: “Experimental study of static and low-frequent electromagnetic properties of ceramic and melted high-temperature superconductors.”, Moscow State University “M.V. Lomonosov”, Russia, 1996.

## International scientific journals

- [1] **J Mirkovic**, S Savelev, I Kakeya, T. Kashiwagi, B. Markovic, K Kadowaki / *Tilted vortex lattice in irradiate  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  single crystals // Journal of Physics Conference Series 667(1):012007 (2016)*.
- [2] T. Kashiwagi, T. Yamamoto, H. Minami, M. Tsujimoto, R. Yoshizaki, K. Delfanzari, T. Kitamura, C. Watanabe, K. Nakade, T. Yasui, K. Asanuma, Y. Saiwai, Y. Shibano, T. Enomoto, H. Kubo, K. Sakamoto, T. Katsuragawa, B. Markovic, **J. Mirković**, R. A. Klemm, and K. Kadowaki / *Efficient Fabrication of Intrinsic-Josephson-Junction Terahertz Oscillators with Greatly Reduced Self-Heating Effects // Physical Review Applied 4(5)*, Nov. 2015, DOI: 10.1103/Phys. Rev. Applied. 4.054018
- [3] T. Kashiwagi, K. Nakade B. Markovic Y. Saiwai H. Minami, T. Kitamura K. Ishida S. Sekimoto K. Asanuma T. Yasui Y. Shibano M. Tsujimoto T. Yamamoto, J. Mirkovic, K. Kadowaki // *Reflection type of terahertz imaging system using a high-Tc superconducting oscillator // Applied Physics Letters 104(2):022601-5* January 2014, DOI: 10.1063/1.4861602
- [4] T. Kashiwagi, K. Nakade, Y. Saiwai, H. Minami, T. Kitamura, C. Watanabe, K. Ishida, S. Sekimoto, K. Asanuma, T. Yasui, Y. Shibano, M. Tsujimoto, T. Yamamoto, B. Markovic, **J. Mirkovic**, R. A. Klemm, and K. Kadowaki / *Computed tomography image using sub-terahertz waves generated from a high-Tc superconducting intrinsic Josephson junction oscillator // Applied Physics Letters 104*, 082603 (2014); doi: 10.1063/1.4866898
- [5] **Jovan Mirkovic**, Alexandre Buzdin, Takanari Kashiwagi, Takashi Yamamoto, Kazuo Kadowaki / *Crossover from Crossing to Tilted Vortex Phase in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  Single Crystals near ab-plane // Physica C: Superconductivity and its applications, Physica C 484 (2013) 77–80*.
- [6] **J. Mirkovic**, T. Kashiwagi, T. Saito, T. Yamamoto, K. Kadowaki / *Geometry dependent resistivity behavior in mesoscopic  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  single crystals // Physica C 471 (2011) 787–789*.
- [7] **Jovan Mirkovic**, Takashi Saito, Takanari Kashiwagi, Itsuhiro Kakeya, Yuimaru Kubo, Takashi Yamamoto, Ahmet Oral, Kazuo Kadowaki / *Vortex States in Magnetic Fields near ab-plane in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  Crystal // Physica C 470 (2010) S790–S792*
- [8] T. Kashiwagi, K. Nakade, B. Markovic, Y. Saiwai, H. Minami, T. Kitamura, C. Watanabe, K. Ishida, S. Sekimoto, K. Asanuma, T. Yasui, Y. Shibano, M. Tsujimoto, T. Yamamoto, **J. Mirkovic**, and K. Kadowaki / *Reflection type of terahertz imaging system using a high-Tc superconducting oscillator // Applied Physics Letters 104*, 022601 (2014)
- [9] T. Kashiwagi, K. Nakade, Y. Saiwai, H. Minami, T. Kitamura, C. Watanabe, K. Ishida, S. Sekimoto, K. Asanuma, T. Yasui, Y. Shibano, M. Tsujimoto, T. Yamamoto, B. Markovic, **J. Mirkovic**, R. A. Klemm, and K. Kadowaki / *Computed tomography image using sub-terahertz waves generated from a high-Tc superconducting intrinsic Josephson junction oscillator // Applied Physics Letters 104*, 082603 (2014)
- [10] **Jovan Mirkovic**, Takashi Saito, Takanari Kashiwagi, Takashi Yamamoto, Kazuo Kadowaki / *Crossing Vortex Lattice and Lock-In Vortex State in Mesoscopic  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  Crystal // Physica C 470 (2010) S793–S794*.
- [11] **J. Mirkovic**, Y. Kubo, T. Saitou, I. Kakeya, T. Yamamoto, A. Oral, K. Kadowaki / *Vortex States in Mesoscopic  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  Crystal in High Magnetic Fields // Physica C 469*, 1119 (2009).
- [12] **Jovan Mirkovic**, Sergey Savelev, Hirokazu Sato, Franco Nori, Kazuo Kadowaki / *Melting of Vortex Solid in Irradiated  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  Single Crystals in Tilted Magnetic Fields // New Journal of Physics (ISSN: 1367-2630) Vol 8*, 226 (1-14) (2006).
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- [14] **J. Mirkovic**, A. Satou, A. Nakano, T. Yamamoto, I. Kakeya, and K. Kadowaki / *Phase Transition from Crossing Lattice to Tilted Lattice Near ab-plane in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  Single Crystal // AIP Conf. Proc. (ISSN:0094-243X)*, Volume 850, 2006, p. 801 (2006).
- [15] **Jovan Mirković**, Shintaro Hayama, Atsushi Nakano, Krsto Ivanović, Jovan Setrajic, and Kazuo Kadowaki / *Vortex Phases in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$  Single Crystals in Tilted Magnetic Fields // Materials Science Forum (ISSN:0255-5476)*, Vol. 67, p. 453 (2004).
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- [18] Sergey Savelev, **Jovan Mirković**, Franco Nori / *Fluctuations in the Josephson-pancake combined vortex lattice // Physica C: Superconductivity (ISSN:0921-4534)*, Vol. 388-389, 653 (2003).
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- [23] J. Mirković, S.E. Savel'ev, E. Sugahara and K. Kadowaki / Melting Transition in Single Crystals of  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$  Studied by the c-axis and In-plane Resistivity Measurements in Parallel Magnetic Fields // *Physica C: Superconductivity and its Applications* (ISSN:0921-4534), Vol. 378-381, 429 (2002).
- [24] J. Mirković, S.E. Savel'ev, E. Sugahara and K. Kadowaki / Dimensionality of Vortex Solid and Liquid Phases in Single Crystals of  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$  Studied by the Resistivity Measurements // *Physica C: Superconductivity and its Applications* (ISSN:0921-4534), Vol. 378-381, 492 (2002).
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#### National scientific conferences:

- [1] Kutlača Đuro, Jovan Mirković, Mr. Sandra Tinaš: "Research and Development and Innovation Activities in Montenegro", XVI Scientific conference: "Technology, culture and development: The Western Balkans Countries on Their Way to the European Union, Conference proceeding, ed. Vlastimir Matejić, publishers: NGO «Technology and Society», Mihajlo Pupin Institute, and Faculty of Economics Subotica, pp. 295-303, ISBN 978-86-904137-9-9, COBISS.SR-ID 181574924, UDK 378.014.5(082) 005.94(082), Tivat, Montenegro, September 1-3, 2010.
- [2] J. Mirković, K. Murata, H. Satou, T. Yamamoto, I. Kakeya, K. Kadowaki, S. Savelev, and F. Nori // *Study of vortex state Vortex Matter in Layered  $Bi_2Sr_2CaCu_2O_{8+\delta}$  Superconductors* // Contemporary mathematics, physics and biology, Proceedings of the Workshop devoted to 25th Anniversary of the Faculty of Natural Sciences and Mathematics, 8-9 September, 2005, Podgorica, Yugoslavia.

#### PhD Dissertation:

"Experimental study of static and low-frequent electromagnetic properties of ceramic and melted high-temperature superconductors.", Moscow State University "M.V. Lomonosov", Russia, 1996.

#### Annex 2

Jovan Mirkovic

#### List of projects:

- „Superconducting Nanotechnologies”, Ministry of Science, Montenegro, 2018-2019
- Youth Science Forum / Debate Science – HORIZON2020 / 2018-2020
- "Nanoscale Coherent Hybrid Devices for Superconducting Quantum Technologies" (NANOCOHYBRI) CA16218, 2017-2020
- „Physics of Nanostructures”, Ministry of Science, Montenegro, 2013-2016
- Physical properties of layered superconductors”, Ministry of Science, Montenegro, 2008-2011.
- "Montenegro in XXI Century - in the Era of Competitiveness: Science and Technology", Coordinator, Montenegrin Academy of Sciences and Arts, Podgorica 2009-10.
- „Science and Youth”, Montenegrin Science Promotion Foundation PRONA, 2009
- Science Festival - Researchers' Night 2009-2015, Podgorica, Montenegro (Program Director)
- Summer Physics School 2008 - 2010; Summer School of Physics and Mathematics 2011, Ivanova Korita (Program Coordinator)
- Winter Science School 2009 - 2012 (Coordinator)
- Summer School Planet in Your Hands 2011-2013
- Inquiry based science education methods program, 2011
- Students impact on Quality Assurance of High Education in Montenegro, 2009-10
- „Science and Youth”, Montenegrin Science Promotion Foundation PRONA, 2009
- „Theoretical and experimental investigation of thermodynamic and transport properties of superconductors", Ministry of Education and Science", Montenegro, 2005-2007
- „Introduction to Experimental Physics", Course development program (CDP+), WUS-Austria, 2004
- Multidisciplinary Centre for Experimental Study, World University Service - Austria, 2003.