

НАУЧНОМ ВЕЋУ
ИНСТИТУТА ЗА ФИЗИКУ, Београд

Предмет: Захтев за покретање поступка за избор у звање
Научни сарадник

Молим Научно веће Института за физику да у складу са Законом о научно-истраживачкој делатности покрене поступак за мој избор у звање Научни сарадник.

Прилози:

1. Сагласност руководиоца пројекта и предлог чланова Комисије.
2. Биографски подаци са библиографијом
3. Кратки опис научне и стручне активности

потпис
Др Радмила Панајотовић

19. Децембар 2017.

Сагласност руководиоца пројекта и предлог чланова Комисије за писање извештаја

Др Радмила Панајотовић је од новембра 2012. године ангажована са пуних дванаест истраживачких месеци на пројекту ОИ171005 „Физика уређених наноструктура и нових материјала у фотоници“, под мојим руководством, а на посебним задацима експерименталног истраживања везаним за нови правац истраживања у оквиру наведеног пројекта. Тема истраживања Др Панајотовић је испитивање морфолошких, електричних и хемијских особина самоорганизујућих органских молекулских структура формираних на проводним и диелектричним супстратима, са посебним нагласком на силицијум диоксид и 2Д-материјале, као што је графен. Циљ испитивања оваквих хетероструктура је градња ефикасних и робусних биохемијских и фото-сензора, као и осетљивих детектора наелектрисаних честица. Овај правац истраживања је потпуно нов и у оквиру Института за физику и шире, у Србији. Др Панајотовић у својим истраживањима примењује методе Атомске микроскопије силе, микроскопије Келвиновом пробом, фотоелектронске и инфрацрвене спектроскопије, и многе друге. Такође, она је истраживач са установљеном научном репутацијом ($h - index = 14$, Googl Scholar), била је активна и у организационим активностима, као генерални секретар две међународне конференције, и у сарадњи са страним лабораторијама. Моментално је ментор докторског студента.

Сагласан сам са кандидатуром Др Радмиле Панајотовић за избор у звање Виши научни сарадник и предлажем следеће чланове Комисије за писање извештаја:

- **Др Радош Гајић** – Научни саветник, Институт за физику, Београд
Главне области истраживања Др Гајића су метаматеријали, фотонски кристали, елипсометрија, нано-оптика, високо-температурска суперпроводност и графенски материјали
- **Др Братислав Маринковић** – Научни саветник, Институт за физику,
Главне области истраживања Др Маринковића су електронска и ласерска спектроскопија атома и молекула (укључујући биомолекуле).
- **Др Јелена Трајић**, Виши научни сарадник Института за физику, Београд
Главне области истраживања Др Трајић су оптичка својства полупроводника, полумагнетних полупроводника и диелектрика, динамика решетке, Инфра-црвена и Раман спектроскопија.
- **Проф. Др Сунчица Елезовић-Хацић** – Редовни професор Физичког факултета Универзитета у Београду
Главне области истраживања Професорке Елезовић-Хацић су полимерне структуре и неуређени органски и неоргански системи

.....
Руководилац пројекта ОИ171005
Др Радош Гајић

у Београду, 19. 12. 2017.

Библиографија - Др Радмила Панајотовић

(радови објављени после датума стицања претходног звања)

M21a

1. Aleksandar Matković, Ivana Milošević, Marijana Milićević, Tijana Tomašević-Ilić, Jelena Pešić, Milenko Musić, Marko Spasenović, Djordje Jovanović, Borislav Vasić, Christopher Deeks, Radmila Panajotović, Milivoj R Belić and Radoš Gajić, „Enhanced sheet conductivity of Langmuir–Blodgett assembled graphene thin films by chemical doping“, 2D Mater. 3 (2016) 015002

[IF 2016: 6.9; 26/279]

M28b

1. PHOTONICA'13: 4th International School and Conference on Photonics Preface
By: Popovic, Duska; Gajic, Rados; Panajotovic, Radmila
PHYSICA SCRIPTA Volume: T162 Article Number: 010301 Published: SEP 2014
Guest Editors: Duška Popović, Radoš Gajić and Radmila Panajotović

M31

1. Radmila Panajotović, “Radiation effects of slow electrons on biomolecules – where the experiment and theory meet”, Proceedings of 2nd International Conference TABIS2013, Ed. Institute of Physics, Belgrade, Serbia, ISBN 978-86-82441-40-3, p.153-165

M32

1 „*Electron-beam damage from SEM to lipid-(graphene, MoS₂, WS₂) heterostructures*”, Fourth International Conference on Radiation and Applications in Various Fields of Research, May 23-26, 2016, Niš, Serbia

2. “Molecular and Atomic Nanoclusters on self-assembled supported lipid multilayer structures”, Characterisation of Nanomaterials and Nanomedicine, Nanobiotechnology enlargement workshop, November 23-25, 2015, Ispra, Italy

3. „Electrostatic landscape of arginine on a multilayer DPPC-covered solid substrate“, 15th International Scanning Probe Microscopy Conference, ISPM DIJON 2013, 30th June – 3rd July, Dijon, France

M33

1. Radmila Panajotović and Jasna Vujin, „MODIFICATIONS OF LIPID/2D-MATERIAL HETEROSTRUCTURES BY SEM“,

SPIG 2016, CONTRIBUTED PAPERS & ABSTRACTS OF INVITED LECTURES, TOPICAL INVITED LECTURES, PROGRESS REPORTS AND WORKSHOP LECTURES, 29. August – 2. September 2016, Belgrade, Serbia, Ed. Dragana Marić, Aleksandar Milosavljević, Bratislav Obradović and Goran Poparić, University of Belgrade, Faculty of Physics, Belgrade, Serbia, p.

2. R. Panajotović, S. Ptasinska, V. Lyamayev, and K. Prince, „Low-energy Electron Damage of DPPC Molecules – A Nexafs Study“, *Rad. Applic.* 2016, **1**, 1, 46-50, DOI: 10.21175/Rad. J. 2016.01.09 ISSN 2466-4294

M34

(рецензирани радови означени звездичом)

*1. T. Szabó, T. Tomashevich, R. Panajotović, Jasna Vujin, Abd Elaziz Sarrai, G. Váró, Zs. Szegletes, G. Garab, K. Hajdu, L. Nagy, “Photosynthetic reaction-center/graphene biohybrid for optoelectronics”, 5th International Conference on Biosensing Technology, Riva del Garda, 2017, 7-10 May, Italy, P121

2. Szabó Tibor, T. Tomashevich, R. Panajotović, Abd Elaziz Sarrai, Szegletes Zsolt, Váró György, Hajdu Kata, Máthé Botond, Szabó Anna, Hernádi Klára, Nagy László, “Possible applications of carbon based bio-nanocomposites in optoelectronics”, XXVth Congress of the Hungarian Biophysical Society, 2017. August 22-25, Szeged, p54

*3. T. Tomašević-Ilić, . Matković, J. Vujin, . Panajotović, M. Spasenović, R. Gajić, “p-type field-effect transistors based on liquid phase exfoliated MoS₂”, Graphene 2017, March 28-31, Barcelona, Spain, Abstract Book, http://www.grapheneconf.com/Files/Graphene2017_AbstractsBook.pdf

4. Jasna Vujin and Radmila Panajotović, “2D-materials heterostructures as a potential sensor of aminoacids and proteins, 15th Young Researchers conference – Materials Science and Engineering, December 7-19, 2016, SASA Institute, Belgrade, Serbia, Program and Book of Abstracts, Institute of Technical Sciences of SASA, Belgrade, Serbia, Ed, Dr Milja Marković, p.4

*5. Jasna Vujin, Đorđe Jovanovic and Radmila Panajotović, „PHYSICO-CHEMICAL CHARACTERIZATION OF LIPID-2D-MATERIALS SELF-ASSEMBLY FOR BIOSENSORS“, Book of Abstracts, Fourth International Conference on Radiation and Applications in Various Fields of Research, May 23-26, 2016, Niš, Serbia, Ed. G. Ristić, University of Niš, Faculty of Electronic Engineering, Niš, Serbia, p58, ISBN: 978-86-6125-160-3

*6. T. Szabó, T. Tomashevich, R. Panajotović, Gy. Váró, G. Garab, K. Hajdu, K. Hernadi, L. Nagy, „Carbon-based biohybrides for optoelectronics“, Book of Abstracts, Regional Biophysics Conference (RBC2016), 25-28 August 2016, Trieste (Italy), Ed. Università di Trieste, Italy, ISBN 978-88-8303-757-3 (print), ISBN 978-88-8303-758-0 (online), p.69

7. Radmila Panajotovic and Nigel Mason, “Electron irradiation of lipid-amino acid complex”, Electron Controlled Chemical Lithography (ECCL) 2012 Meeting, COST Action CM0601, 18-22 May 2012, Stykkisholmur, Iceland

*8. R. Panajotovic, M. Schnietz, A. Turchanin, N. Mason and A. Goelzhauser „Effects of electron-beam irradiation on phospholipid/amino acid complexes“, CMD-24, 24th General Conference of the Condensed Matter Division of the European Physical Society, 3-7 September

2012, Edinburg International Conference Centre, Edinburgh, Scotland, UK, Book of Abstracts, p.445

9. S. Jheeta, D. Fulvio, M.E. Palumbo, A.Domaracka, R. Panajotovic, B. Sivaraman, S. Ptasinska, E. Burean, G. Strazzulla, A. LaFosse, J. Mason,
 “Co-conspirators: Space, molecules and life”, 39th COSPAR Scientific Assembly 2012, 14.-22. July 2012, Misore, India, Book of Abstracts, p. 826

10. R.Panajotovic, M. Schnietz, A. Turchanin, N. Mason and A. Goelzhauser
 „Effects of electron-beam irradiation on phospholipid/amino acid complexes“,
 CMD-24, 24th General Conference of the Condensed Matter Division of the European Physical Society, 3-7 September 2012, Edinburg International Conference Centre, Edinburgh, Scotland, UK, Book of Abstracts, p.445

M36

1. Book of Abstracts of **IV International School and Conference on Photonics-PHOTONICA 2013**, 26-30 August 2013, Belgrade, Serbia; *Editors*:D. Jović, B. Vasić, D. Timotijević, R. Panajotović i R. Gajić

2. *P r o c e e d i n g s* of the 2nd International Conference “Theoretical Approaches to BioInformation Systems” (TABIS.2013), September 17 – 22, 2013, Belgrade, Serbia
Editors: B. Dragovich, R. Panajotović, D. Timotijević

M62

1. R. Panajotović

“*Effects of water adsorption on thin films of graphene and tungsten disulfide as active components for biochemical sensors*”, 10th Photonics workshop, Kopaonik, Serbia, 28.02.-02.03.2017

2. R. Panajotović

„*FT-IR merenja efekata dejstva niskoenergijskog mlaza na kompleks fosfolipida i arginina*“, Šesta radionica Fotonike (2013), Kopaonik, 4-8. mart 2013

Научни сарадник		Неопходно
		Укупно
		16
Обавезни 1	M10+M20+M31+M32+M33+M41+M42	10
Обавезни 2	M11+M12+M21+M22+M23	6
		Остварено
Укупно:	M21a + M28b + M31 + 3 x M32 + 2 x M33 + 2 x M36 + 10 x M34 + 2 x M62	32.5
Обавезни 1	M21a +M28b + M31 + 3 x M32 + 2 x M33	22.5
Обавезни 2	M21a	10
После нормирања рада M21a	Укупно:	28.8
	Обавезни 1	18.8
	Обавезни 2	6.3

Curriculum Vitae

Dr Radmila Panajotović

Prethodne i sadašnje pozicije (zaposlenje)

05. 2012. - Viši nučni saradnik, Institut za fiziku, Beograd
Projekat OI171005 „Fizika uređenih nanostrukture i novih materijala u fotonici“
07. 2011. - 05. 2012. Naučni saradnik Instituta za fiziku, Beograd, Srbija; projekti - „Elektronske, transportne i optičke osobine nanofaznih materijala“ (171033), a drugim na projektu „Fizika uređenih nanostrukture i novih materijala u fotonici“ (171005), finansiranim od strane Ministarstva za Nauku i Prosvetu Republike Srbije.
10. 2007. – 11. 2010. Postdoktorska pozicija (Research Fellow) u Centru za fiziku i astronomiju, na Otvorenom Univerzitetu (Open University), Milton Kijns (Milton Keynes), Velika Britanija
03. 2004 - 02. 2007. Postdoktorska pozicija u Centru za nuklearnu medicinu i radiobiologiju Univerzitet u Šerbruku (University of Sherbrooke), Šerbruk (Sherbrooke), Kvebek, (Quebec), Kanada
11. 1999 - 11. 2003. Postdoktorska pozicija u Laboratoriji za atomsku i molekularnu fiziku (Atomic and Molecular Physics Laboratory), Istraživačka škola fizike i inženjerstva (Research School of Physical Sciences and Engineering), Australijski nacionalni univerzitet (Australian National University), Kanbera, Australija
- 10.1989. – 11. 1999. Magistarske i doktorske studije u Institutu za fiziku, Beograd, Jugoslavija/ Srbija

Akademsko obrazovanje i trening

06. 07. 1999. **Doktorat** iz oblasti eksperimentalne fizike atoma i molekula, Fizički fakultet, Univerzitet u Beogradu, Beograd, Jugoslavija
24. 06. 1993. **Magistarski rad** iz oblasti eksperimentalne fizike atoma i molekula, Fizički fakultet, Univerzitet u Beogradu, Beograd, Jugoslavija
14. 07. 1989. **Diplomski rad** iz oblasti eksperimentalne fizike atoma i molekula, Fizički fakultet, Univerzitet u Beogradu, Beograd, Jugoslavija

Neformalni trening

- 03.2001. - 06. 2001. CEDAM interaktivni kurs Podučavanje na univerzitetu (*Teaching at University*), Australijski nacionalni univerzitet, Kanbera, Australija
11. 1996. - 07. 1997 Poslediplomski staž na Univerzitetu Pjer i Marija Kiri, Pariz VI, Pariz, Francuska

Grantovi, nagrade i priznanja

- SIT (Senior Scholar in Training) grant za prezentaciju i predavanje na mini-simpozijumu u okviru konferencije *Radiation Research Society Conference* na Mauiju, Havaji, Sjedinjene Američke Države
- COST-ECCL grant za kolaborativnu posetu u martu 2009. godine, na Univerzitetu Bielefeld, Nemačka
- Mari Kiri Internacionalni Reintegracioni grant (poziv 2007) (Marie Curie International Reintegration Grant) - 100 000 EUR za period od četiri godine (2008 – 2012)
- Leverhulme Trust Istraživački grant (Researcher Fellowship)
- SIT (Scholar in Training) grant za oralnu prezentaciju rada na konferenciji *Radiation Research Society*, (2006) Filadelfija, Sjedinjene Američke Države
- Istraživački grant za opremu (Research Equipment Fund grant funding – RIEF) sa Prof. Stiven Bakman, Dr Maarten Hoherland i Dr Džulijan Louer) za 2001. godinu (92 000 AUD).
- Stipendija francuske Vlade (bivši CIES) za osmomesetni boravak u Laboratoriji za dinamiku jona i molekula (Laboratory for the Dynamics of Ions and Molecules - DIAM), Univerzitet Pjer i Mari Kiri, Pariz, Francuska (1996-1997).
- Nagrada Instituta za fiziku u Beogradu za najbolji magistarski rad za 1993. godinu.

Članstva u profesionalnim udruženjima

Radiation Research Society of Serbia

Istraživačko iskustvo

Tehnike skenirajuće mikroskopije

Atomska mikroskopija sile, uključujući skeniranje kelvinovom probom – analiza topoloških i elektrostatičkih osobina tankih filmova organskih i neorganskih materijala u ambijentalnim uslovima I u uslovima ultra-visokog vakuuma.

Tehnike pripreme tankih filmova

Priprema i transfer Langmir-Blodžet jednostrukih i višeslojnih molekularnih uzoraka. Termički i hemijski tretman silicijumskih supstrata.

Spektroskopija biomolekula u kondenzovanoj fazi

Fotoelektronska spektroskopija x-zracima (X-ray photoelectron spectroscopy – XPS I NEXAFS) tankih kondenzovanih filmova.

Elektronska spektroskopija gubitka energije (High-Resolution Electron Energy-Loss - HREEL) rasejanja niskoenergijskih elektrona na molekularnim filmovima koji sadrže DNK i njene konstituente.

Analiza jednostrukih i dvostrukih prekida u strukturi DNK izazvanih udarom niskoenergijskih elektrona.

FT-IR spektroskopija tankih filmova.

Elektronska spektroskopija molekula u gasnoj fazi

Merenja apsolutnih elastičnih i neelastičnih efikasnih preseka i ekscitacionih funkcija za elektronsko rasejanje na molekulima (azot, azot monoksid, etilen, tetrafluoroetilen, itd.), kao i merenja negativnih molekularnih jona.

Koincidentna merenja elektrona i proizvoda sudara sa atomima i molekulima primenom metode vremena preleta i sinhrotronskog zračenja (Time-of-Flight)

Elektronska spektroskopija atoma

Merenja apsolutnih elastičnih i neelastičnih efikasnih preseka i ekscitacionih funkcija za elektronsko rasejanje na parama metala (živa, cink, magnezijum) i plemenitih gasova (argon, helijum).

Merenja metastabilnih atoma i negativnih atomskih jona.

Koincidentna merenja rasejanja elektrona na atomima plemenitih gasova (helijum, ksenon).

Pregled iskustva u eksperimentalnim tehnikama i metodama

Sistemi i instalacije ultra visokog vakuuma.

Rad na sinhrotronskim linijama.

Infracrvena spektroskopija.

Atomska mikroskopija sile.

Projektovanje, gradnja implementacija elektronsko-optičkih sistema (pulsirani izvori elektrona, detektori naelektrisanih čestica).

Rad sa masenim spektrometrima.

Proizvodnja tankih filmova kondenzovanih molekula metodama isparavanja, liofilizacije i prenosa sa graničnih površina (vazduh/tečnost).

Manipulacija i prečišćavanje plazmidne DNK.

Korišćenje instrumenata za detekciju naelektrisanih čestica i obradu signala.

Operativnost sa komercijalnim programskim paketima - CASA, OMNIC, EIS, Material Studio, SIMION, Lab View, COBOLD, Origin, Microsoft Office, etc

Pedagoški rad

Ko-mentorstvo diplomskog (Joanne Harrison) i doktorskog studenta (Milica Jelisavčić)

Obuka studenata u laboratorijskom radu.

Predavanja, ispiti i ocenjivanje studenata.

Obuka studenata u pisanju finalnih izveštaja.

Predavanja fizike u srednjoj školi po Kejmbridž kursu.

Dodatno iskustvo i aktivnosti

Organizovanje međunarodnih konferencija (Generalni sekretar za PHOTONICA13 i TABIS2013)

Organizovanje seminara u okviru grupe i Centra.

Recenzija članaka za istaknute međunarodne časopise - *Journal of Physical Chemistry, Physical Chemistry Chemical Physics, Nucleic Acids Research, Applied Surface Science, Journal of Physics D*.

Gost-editor za poseban broj časopisa *Physica Scripta*.

Član grupe eksperata za ocenjivanje REA-FET-OPEN Horizon2020 projekata.

Tečno znanje engleskog i francuskog jezika.

Spisak publikacija, pozivnih predavanja i prezentacija na konferencijama

Publikacije u naučnim časopisima

1. Aleksandar Matković, Ivana Milošević, Marijana Milićević, Tijana Tomašević-Ilić, Jelena Pešić, Milenko Musić, Marko Spasenović, Djordje Jovanović, Borislav Vasić, Christopher Deeks, Radmila Panajotović, Milivoj R. Belić and Radoš Gajić, „Enhanced sheet conductivity of Langmuir–Blodgett assembled graphene thin films by chemical doping“, *2D Mater.* 3 (2016) 015002

2. R. Panajotović, S. Ptasinska, V. Lyamayev, and K. Prince, „Low-energy Electron Damage of DPPC Molecules – A Nexafs Study“, *Rad. Applic.* 2016, 1, 1, 46-50, DOI: 10.21175/Rad. J. 2016.01.09 ISSN 2466-4294

3. M. Lange, J. Matsumoto, A. Setiawan, R. Panajotovic, J. Harrison, J. C. Lower, D. S.

Neman, S. Mondal, and S. J. Buckman, “Angle-resolving time-of-flight electron spectrometer for near- threshold precision measurements of differential cross sections of electron-impact excitation of

- atoms and molecules” - *Rev. Sci. Instr.* **79** (4) (2008) 043105
4. Radmila Panajotovic and Leon Sanche, “From DNA to nucleic bases - the effects of low-energy electron impact”, *J. Phys: Conference Series*, **88** (2007) 012074
 5. J. Lower, R. Panajotovic, S. Bellm, and E. Weigold,
“Invited Article: An improved double-toroidal spectrometer for gas-phase (e, 2e) studies”- *Rev. Sci. Instr.* **78** (2007) 111301
 6. Radmila Panajotovic, Marc Michaud and Léon Sanche,
“Cross sections for low-energy electron scattering from adenine in the condensed phase”- *Phys. Chem. Chem. Phys.* **9** (2007) 138 (“hot article”)
 7. Radmila Panajotovic, Julian Lower and Erich Weigold, A. Prideaux and D. H. Madison
“(e,2e) measurements on xenon: Re-examination of the fine-structure effect” - *Phys. Rev. A* **73** (2006) 052701
 8. Radmila Panajotovic, Frédéric Martin , Pierre Cloutier , Darel Hunting , and Léon Sanche
"Effective Cross Sections for Single Strand Break Production in Plasmid DNA by to 4.7 eV electrons" – *Radiation Research*, **165** (2006) 452-459
 9. D. V. Fursa, I. Bray, R. Panajotovic, D. Ševic, V. Pejcev, D. M. Filipovic, and B. Marinkovic
“Excitations of 1P levels of zinc by electron impact on the ground state” - *Phys. Rev. A*, **72**, 012706 (2005)
 10. R. Panajotovic, M. Jelisavcic, R. Kajita, T. Tanaka, M. Kitajima, H. Cho, H. Tanaka, and S. J. Buckman “Electron scattering from tetrafluoroethylene” - *J. Chemical Physics*, **121** 4559 (2004)
 11. M. Jelisavcic, R. Panajotovic, M. Kitajima, M. Hoshino, H. Tanaka, and S. J. Buckman,
“Electron scattering from perfluorocyclobutane (c-C4F8)” - *J. Chemical Physics*, **121** 5272 (2004)
 10. R. Panajotovic, D. Ševic, V. Pejcev, D. M. Filipovic, and B. Marinkovic
“Small-angle electron scattering from zinc” - *Int. J. Mass. Spectrom.* **233**, 253 (2004)
 12. L. Campbell, M.J. Brunger, Z.Lj. Petrovic, M. Jelisavcic, R. Panajotovic, S.J. Buckman
“Infrared Auroral Emissions Driven by Resonant Electron Impact Excitation of NO molecules” – *Geophysical Research Letters*, **31** L10103 (2004)
 13. Lower, J. Panajotovic, R, and Weigold, E
“Recent progress in quantum-state resolved ionization experiments” – *Physica Scripta* **T110** 166-171 (2004)
 14. Buckman, S J, Panajotovic, R, and Jelisavcic, M
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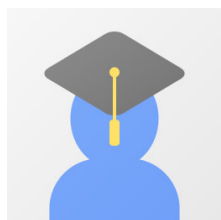
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Dr Radmila Panajotović, Viši naučni saradnik

Dr Radmila Panajotović je doktorirala (1999.) na Fizičkom fakultetu Prirodno-matematičkog fakulteta Univerziteta u Beogradu godine, u oblasti eksperimentalne atomske i molekularne fizike, na temi elektronske spektroskopije para metala (eksperimentalna merenja urađena u Institutu za fiziku, Beograd). Posle završenih doktorskih studija provela je više od deset godina na post-doktorskom usavršavanju u inostranstvu, u renomiranim laboratorijama na Australijskom Nacionalnom Univerzitetu (Kanbera, Australija), Medicinskom fakultetu Univerziteta u Šerbruku (Kvebek, Kanada) i Otvorenom univerzitetu (Milton Kijns, Velika Britanija), gde je radila u oblasti elektronske, fotoelektronske i infracrvene spektroskopije molekula u gasnoj i kondenzovanoj fazi. Od 2004. godine glavna tema njenih istraživanja su interakcije elektrona sa biomolekulima, posebno sa molekulom DNK i izolovanim nukleinskim bazama u obliku tankih filmova, sa ciljem otkrivanja vrste i veličine oštećenja koje sekundarne naelektrisane čestice ("δ-electroni"), kreirane duž traga jonizujućeg zračenja, proizvode na ćelijskom genetskom materijalu. Ovo istraživanje je imalo za cilj otkrivanje mogućih procesa koji dovode do kidanja lanaca DNK zdravih ćelija, kao i poboljšanje efikasnosti radioterapije kanceroznog tkiva. U martu 2008. godine, Dr Panajotović je, kao dobitnica Mari Kiri FP7 granta (*Research Fellowship* – za reintegraciju kvalitetnih evropskih naučnika koji borave van Evrope), započela rad na svom originalnom projektu istraživanja dejstva elektrona niskih i srednjih energija na samo-organizujuće molekule fosfolipida u obliku jedno- i višeslojnih tankih filmova na provodnim, poluprovodnim i izolatorskim supstratima. Od 2012. godine Dr Panajotović ponovo radi u Institutu za fiziku, Beograd, a u sklopu projekta OI171005 ("Fizika uređenih nanostrukture i novih materijala u nanofotonici") na temi ispitivanja morfoloških i električnih osobina heterostruktura sastavljenih od samoorganizujućih biomolekula (fosfolipidi, amino kiseline) i tankih filmova 2D-materijala (grafen, MoS₂, WS₂). Glavni cilj ovog istraživanja je dizajn i karakterizacija o-FET (organski-*Field-Effect-Transistors*) i TF-FET (Tanki-film - *Field-Effect-Transistors*) biohemijskih senzora kojima bi bilo moguće detektovati metabolički važne molecule u gasnoj i tečnoj fazi. Osim ove teme, istraživačke teme Dr Panajotović uključuju i samorganizujuće osobine biomolekula važnih za funcionisanje biomembrane, adheziju nano-čestica na 2D-materijalima i njihov transport kroz biomolekularne structure, adsorpciju molekula i njihove osobine vezane za alternativne izvore energije, kao i interakcije naelektrisanih čestica sa materijalima.

- Spektroskopija i atomska mikroskopija efekata sudara elektrona sa fosfolipidnim filmovima

Eksperiment se sastojao u merenju efekata dejstva usmerenog monoenergijskog mlaza elektrona energije od 5 do 100 eV na tanke filmove fosfolipida i njihovih kompleksa sa aminokiselinama, primenom FT-R spektroskopije. Pokazano je da se oštećenja fosfolipidnih filmova izazvana elektronima ne javljaju u slučaju prisustva amino kiselina – glicina i arginina. Vibracioni FT-IR spektri su pokazali da ovo zaštitno dejstvo nije rezultat hemijskih kompleksa amino kiselina sa lipidima, već klasterizacije amino kiselina na njihovoj površini koja dovdi do efekta "negativnog" naelektrisanja površine i nemogućnosti prodiranja elektronkog mlaza u oblast fosfolipida.

- Ispitivanje dipolnih interakcija tankih biomolekulskih filmova

Pomoću Atomske spektroskopije sile i Kelvinove probe, posmatrane su i merene promene elektrostatičkog potencijala fosfolipidnih molekula i amino-kiseline arginina deponovanih na dielektričnom i provodnom supstratu i uočeno je da se supra-molekularna struktura lipida

odslikava na oblik, veličinu i naelektrisanje klastera arginina. Zaključak ovog istraživanja je da se, suprotno teorijskim proračunima i delu ranijih eksperimenata na dvostrukim slojevima, u ovim strukturama ne javlja, ni prestrukturiranje, ni prodor molekula vode, a ni hidriranih klastera arginina, u dublje slojeve lipidnih filmova. Takođe, (XPS) fotoelektronski spektri fosfolipida su potvrdili da je prodor molekula vode u fosfolipidni film nedovoljan za transport argininskih klastera.

- Merenje veličine i oblika individualnih nano-čestica silicijum dioksida u morskoj vodi
U okviru COST akcije TD1002 (AFM4NanoBioMed) izvršena su merenja standardizacije postupaka merenja individualnih čestica silicijum dioksida i njihovih klastera suspendovanih u ultra-čistoj vodi i u uzorku morske vode iz severnog Jadrana. Zaključak ovih merenja je da potencijalni toksikološki efekti prisustva ovih nano-čestica u morskoj vodi zavise od sezone i količine organske materije u moru, tj. da ona direktno utiče na veličinu i oblik klastera. U pogledu standardizacije merenja, napravljena je baza mernih rezultata iz pet evropskih laboratorija (Ruđer Bošković, Hrvatska; CEA Marcule, Francuska; INSERM, Francuska; Institut za fiziku, Beograd, Srbija; LGM-CIMaINa, Italija, Institut Gabrijel Lipman, Luksemburg).

- “XPS”- Fotoelektronska spektroskopija tankih filmova 2D-materijala

U saradnji sa kompanijom Thermo Fischer Scientific (UK) i Univezitetom Notre Dame (USA), urađena su merenja na grafenskim filmovima dopiranim azotnom kiselinom, kao i ostalim 2D-materijalima, WS_2 , MgB_2 i h-BN. Merenja na azotom dopiranom grafenu (deponovanom iz tečne ekfolijacije na PET supstratu), na sobnoj temperaturi, prisustvo hemijskih veza azota i kiseonika u površinskim slojevima grafena tretiranog pomoću HNO_3 . Hemijska modifikacija grafena azotom se najbolje manifestovala kroz pomak vezivne energije u hemijskoj vezi ugljenika i kiseonika. Ispostavilo se da je u dopiranom grafenu kiseonik smešten u dubljim slojevima filma, najverovatnije između “flekica” grafena. XPS spektri su, tako, pokazali da azot nije vezan u samu strukturu grafena jer bi to značilo n-dopiranje, što nije slučaj. Zaključak je da, najverovatnije, povećanje provodnosti azotom dopiranog grafena potiče od C=O-, C(O)OH- i NO veza.

Pored ovog, merenja na tankim filmovima 2D-materijala su pokazala da je grejanje tankih filmova (iz tečne ekfolijacije) od suštinskog značaja za njihove električne performanse i da je prisustvo vode u strukturi površine značajno u smislu degradacije granularne strukture i provodnosti ovih filmova.

Dr Panajotović je ekspert u širokom spektru eksperimentalnih tehnika i instrumenata, kao što su tehnika ultra-visokog vakuuma (UHV), elektronska optika, depozicija tankih filmova, tehnika Langmir-Blodžet za prenošenje tankih filmova na čvrste podloge, diodnih lasera, izora i detektora naelektrisanih čestica i fotona, korišćenja Atomskog mikroskopa sile, Infra-crvene spektrometrije, itd. Dr Panajotović je autor 23 rada u istaknutim međunarodnim časopisima koji su citirani više od 400 puta (h-index=13, Google scholar), velikog broja konferencijskih kontribucija i brojnih predavanja. Tokom svog post-doktorskog usavršavanja u inostranstvu bila je ko-mentor u izradi diplomskog i doktorskog rada, a momentalno je ko-mentor doktorantu Jasni Vujin. Takođe je bila predsedavajući na sekciji Radiation Physics na konferenciji RAD2015, obavljala funkciju Generalnog sekretara dveju međunarodnih, predstavljala Srbiju u menadžment komitetu COST TD1002, vodi saradnju sa Univerzitetom u Segedinu i Biofizičkim institutom u Segedinu, koji je deo Mađarske Akademije nauka i Radijacionom laboratorijom Univerziteta Notr Dam, u SAD. Aktivna je i kao recenzent u istaknutim međunarodnim časopisima i za projekte Horizont 2020.