



Scientific Symposium
Days of Diaspora and (Scientific) Partners (of Montenegro)

Naučni simpozijum
Dani Dijaspore i (Akademskih) Prijatelja (Crne Gore)



Podgorica
October 18-19 Oktobar 2023

MICRO-INTERVIEWS with Nobel Laureates for Students of UoM and Diaspora of MNE



INTERVIEW INTERVJU Dan Shechtman

(in relation to DDP-2022) (post refleksije od DDP-2022)

What is the deep essence of your discovery, for which you got The Nobel Prize?

The science of crystallography started with the seminal experiment by von Loue who performed the first x-ray diffraction experiment on a crystal. The crystal that von Loue studied was ordered and periodic as so were many thousands of crystals studied for 70 years until 1982. Over time a definition of a crystal was adopted by the community of crystallographers and the whole scientific community. In essence the definition was – a crystal is a solid material in which the atoms are ordered and periodic. This definition was based on observations rather than on theory. In 1982 I discovered a new class of crystals that are ordered, but not periodic, by transmission electron microscopy. The new order was named quasi-periodic. My discovery created a paradigm shift in crystallography for which I was awarded many prizes, including the Nobel prize.

What is your most important message for students of the University of Montenegro?

*A good scientist is a person that understands nature, who understands the laws of chemistry, physics, mathematics, computer science as well as physiology and thermodynamics, but above all, he or she is an *expert* in one field of science. If you want to succeed as a scientist choose a subject that you like, and try to be number one in it, number one in your class, number one in your school, in your country, in the world. With the wealth of information available today you can do it. If you do that, I promise you great success as a scientist.*

Šta je suština naučnog otkrića zbog kojeg ste dobili Nobelovu nagradu?

Nauka o kristalografiji započela je osnovnim eksperimentom fon Louea koji je izveo prvi rendgenski snimak eksperiment difrakcije na kristalu. Kristal koji je fon Lu proučavao bio je uređen i periodičan kao i hiljade kristala proučavanih tokom 70 godina, sve do 1982. Vremenom je definicija kristala usvojena od strane zajednice kristalografa i cijele naučne zajednice. U suštini, definicija je bila – kristal je čvrsta supstanca, materijal u kome su atomi uređeni i periodični. Ova definicija je zasnovana prije na zapažanjima nego na teoriji. 1982. otkrio sam novu klasu kristala koji su poređani, ali ne periodični, prenosnim elektronom mikroskopija. Novi poredak je nazvan kvaziperiodični. Moje otkriće je stvorilo promjenu paradigme u kristalografiji za koju sam dobio mnoge nagrade, uključujući i Nobelovu nagradu.

Šta je vaša najvažnija poruka studentima Univerziteta Crne Gore?

Dobar naučnik je osoba koja razumije prirodu, koja razumije zakone hemije, fizike, matematike, informatike kao i fiziologije i termodinamike, ali prije svega, on ili ona je "stručnjak" u jednoj oblasti nauke. Ako želite da uspijete kao naučnik, izaberite temu koja vam se sviđa i pokušajte da budete broj jedan u njoj, broj jedan u vašem razredu, broj jedan u vašoj školi, u vašoj zemlji, u svijetu. Uz obilje informacija koje su danas dostupne, to možete učiniti. Ako to uradiš, obećavam ti veliki uspjeh kao naučnika.



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What is your most impressive memory from the times, when you were a student?

It was hard work during my bachelor's years at the Technion, Haifa, Israel, then during the time I performed my Master research I started to enjoy science. I liked the creative part of my scientific work. During my PhD study I became an expert in analyzing microstructure of metallic crystals by transmission electron microscopy and I fell in love with the amazing capability of the microscope.

Koja je vaša najimpresivnija uspomena iz studentskih dana?

Bio je to naporan rad tokom mojih bečelor godina na Tecnionu, Haifa, Izrael, zatim tokom vremena kada sam radio master istraživanje počeo sam uživati u nauci. Sviđao mi se kreativni dio naučnog rada. Tokom doktorskih studija postao sam stručnjak za analizu mikrostrukture metalnih kristala transmisijom elektronskom mikroskopijom i zaljubio se u nevjerovatnu sposobnost mikroskopa.

What is your basic image of Montenegro and what do you suggest for advancement of science of Montenegro?

I visited Montenegro several times with invitation and the gracious hospitality of Professor Veljko Milutinovic. Montenegro is a beautiful country with amazing scenery. It has minerals and fertile agricultural land, with plenty of water. I was impressed by the beauty of the land and the Bay of Kotor. Advancement of science in Montenegro requires a strategic decision by the government. It calls for several actions, among which – teaching modern science to the young, starting in kindergartens, large investment in scientific university departments, scholarships to gifted science students and offering university professorships to scholars only after post-doc in leading world laboratories with proof of success such as authorship of well cited scientific articles. The offer by a university or research laboratory should come with meaningful support to establish a laboratory.

Kakvu predstavu imate o Crnoj Gori i šta predlažete za unapređenje nauke u Crnoj Gori?

Posjetio sam Crnu Goru više puta na poziv i ljubazno gostoprimstvo profesora Veljka Milutinovića. Crna Gora je prekrasna zemlja sa prekrasnim krajolikom. Ima minerale i plodno poljoprivredno zemljište, s obiljem vode. Bio sam impresioniran ljepotom zemlje i Boke kotorske. Unapređenje nauke u Crnoj Gori zahtijeva stratešku odluku Vlade. Zahtijeva nekoliko akcija, među kojima – podučavanje mladih modernoj nauci, počevši od vrtića, velika ulaganja u naučne univerzitetske odsjeke, stipendije talentovanim studentima nauke i ponudu pozicija univerzitetskih profesora istraživačima tek nakon postdoktorskih studija u vodećim svjetskim laboratorijima, s dokazanim uspjehom kao što je autorstvo dobro citiranih naučnih članaka.

The Nobel Prize in Chemistry 2011 was awarded to **Dan Shechtman** "for the discovery of quasicrystals".

Wright-Patterson Air Force Base, Dayton, USA

Johns Hopkins University, Baltimore, USA

National Institute of Standards and Technology, Gaithersburg, USA

Iowa State University, Ames, USA

Technion – Israel Institute of Technology, Haifa, ISR

Tohoku University, Sendai, JPN



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INTERVIEW INTERVJU Konstantin (Kostya) Novoselov (for DDP-2023) (za DDP-2023)

What is the deep essence of your discovery, for which you got The Nobel Prize?

We demonstrated that two-dimensional materials can be stable and available for research and applications. Also, we demonstrated the very unusual properties of graphene – the two-dimensional form of carbon.

Šta je suština naučnog otkrića zbog kojeg ste dobili Nobelovu nagradu?

Pokazali smo da dvodimenzionalni materijali mogu biti stabilni i dostupni za istraživanje i primjenu. Takođe, demonstrirali smo veoma neobična svojstva grafena – dvodimenzionalnog oblika ugljenika.

What is your most important message for students of the University of Montenegro?

Don't listen to any advice. Follow your own interests.

Šta je vaša najvažnija poruka studentima Univerziteta Crne Gore?

Ne slušajte savjete. Slijedite svoja interesovanja.

What is your most impressive memory from the times, when you were a student?

Lots of freedom, lots of opportunities. I was lucky to be able to try many different areas of science, technology, business. It helped me a lot in my life.

Koja je vaša najimpresivnija uspomena iz studentskih dana?

Puno slobode, puno otvorenih prilika. Imao sam sreću što sam mogao da se oprobam u različitim oblastima nauke, tehnologije, biznisa. To mi je puno pomoglo u životu.

What is your basic image of Montenegro and what do you suggest for advancement of science of Montenegro?

Beautiful country with hard-working, dedicated people. There is only one way to nurture science – to support talents. There are enough talents in Montenegro, but any talent needs a support.

Kakvu predstavu imate o Crnoj Gori i šta predlažete za unapređenje nauke u Crnoj Gori?

Preljepa zemlja sa veoma vrijednim i posvećenim ljudima. Postoji samo jedan put za prirodne nauke – podrška talentima. Crna Gora ima dovoljno talentovanih, ali svakom talentu treba podrška.

The Nobel Prize in Physics 2010 was awarded jointly to Andre Geim and **Konstantin Novoselov** “for groundbreaking experiments regarding the two-dimensional material graphene”.

Moscow Institute of Physics and Technology, RUS
Radboud University of Nijmegen, NLD
University of Manchester, GBR
College of Design and Engineering, NUS, SGP



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INTERVIEW INTERVJU Jean-Marie Lehn

(in anticipation of DDP-2024) (u pripremi za DDP-2024)

What is the deep essence of your discovery, for which you got The Nobel Prize?

The study of the chemical basis of molecular recognition. It developed and thereafter it became supramolecular chemistry.

Šta je suština naučnog otkrića zbog kojeg ste dobili Nobelovu nagradu?

Proučavanje hemijske osnove prepoznatljivosti molekula, a zatim se razvila supramolekularna hemija.

What is your most important message for students of the University of Montenegro?

*Science shapes the future of humanity.
Participate!*

Šta je vaša najvažnija poruka studentima Univerziteta Crne Gore?

*Nauka oblikuje budućnost čovječanstva.
Učestvujte!*

What is your most impressive memory from the times, when you were a student?

Wanting to do basic research!

Koja je vaša najimpresivnija uspomena iz studentskih dana?

Čekanje da uradim osnovno istraživanje!

What is your basic image of Montenegro and what do you suggest for advancement of science of Montenegro?

I have no idea except work hard and be creative!

Kakvu predstavu imate o Crnoj Gori i šta predlažete za unapređenje nauke u Crnoj Gori?

Ne pada mi ništa na pamet osim da radite naporno i da budete kreativni!

The Nobel Prize in Chemistry 1987 was awarded jointly to Donald J. Cram, **Jean-Marie Lehn** and Charles J. Pedersen "for their development and use of molecules with structure-specific interactions of high selectivity".

Louis Pasteur University in Strasbourg, FRA
Collège de France in Paris, FRA



INTERVIEW INTERVJU Kurt Wüthrich

(in anticipation of DDP-2025) (u pripremi za DDP-2025)

What is the deep essence of your discovery, for which you got The Nobel Prize?

The ability to visualize biological macromolecules in a solution milieu resembling the environment in body fluids, where these compounds perform their physiological functions.

Šta je suština naučnog otkrića zbog kojeg ste dobili Nobelovu nagradu?

Sposobnost vizualizacije bioloških makromolekula u miljeu rastvora koji liči na okruženje u telesnim tečnostima, gde ova jedinjenja obavljaju svoje fiziološke funkcije.

What is your most important message for students of the University of Montenegro?

At every moment in your life, try to make the best out the given situation.

Šta je vaša najvažnija poruka studentima Univerziteta Crne Gore?

U svakom trenutku vašeg života potrudite se da izvučete ono što je najbolje u datoj situaciji.

What is your most impressive memory from the times, when you were a student?

The excitement about the first original discoveries.

Koja je vaša najimpresivnija uspomena iz studentskih dana?

Osjećaj uzbuđenosti zbog prvih originalnih otkrića.

What is your basic image of Montenegro and what do you suggest for advancement of science of Montenegro?

Always try your best and have fun doing so.

Kakvu predstavu imate o Crnoj Gori i šta predlažete za unapređenje nauke u Crnoj Gori?

Uvijek pokušajte ono što najbolje možete i uz to se zabavite.

The Nobel Prize in Chemistry 2002 was awarded “for the development of methods for identification and structure analyses of biological macromolecules” with one half jointly to John B. Fenn and Koichi Tanaka “for their development of soft desorption ionisation methods for mass spectrometric analyses of biological macromolecules” and the other half to **Kurt Wüthrich** “for his development of nuclear magnetic resonance spectroscopy for determining the three-dimensional structure of biological macromolecules in solution”.

University of California, Berkeley, USA

ETH Zürich, CHE

Scripps Research Institute, La Jolla, USA

ShanghaiTech University, CHN

University of Edinburgh, GBR

Chinese University of Hong Kong, HKG

Yonsei University, Seoul, KOR