



Europass Curriculum Vitae

Personal information

First name(s) / Surname(s) **Razvan Victor Anton DABU**
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Nationality Romanian

Dates **2013 – 2023**

Occupation or position held Senior Researcher (CS I)

Main activities and responsibilities - Research and development in the field of high-power femtosecond laser systems and nonlinear optics
- Thin-film compression of femtosecond laser pulses
- Courses of Solid-State Lasers, Ultrafast Laser Systems, and Nonlinear Optics for ELI-NP researchers

Name and address of employer National Institute for Nuclear Physics and Engineering, ELI-NP, Reactorului Str.30, Magurele, Romania
Type of business Scientific Research, Teaching

Dates **1988 - 2013**

Occupation or position held Senior Researcher, head of the Solid-State Laser Laboratory, Laser Department

Main activities and responsibilities Research and development in the field of:
- Ultrashort laser pulses generation and detection
- Nonlinear optics (harmonics generation, optical parametric oscillation and amplification)
- Laser ablation
- Lasers for material surface cleaning
- Lasers for medical and biological applications
- Design and construction of microchip lasers
- High power femtosecond laser systems
- Materials micro-processing and nano-structuring using ultrafast pulsed lasers.

Name and address of employer National Institute for Laser, Plasma and Radiation Physics (NILPRP), Atomistilor 409, Magurele, Romania
Type of business Scientific Research

Dates **2003-2009**

Occupation or position held Associate professor, Faculty of Physics

Main activities and responsibilities Master course of Nonlinear Optics

Name and address of employer Bucharest University
Type of business Teaching

Dates **1976-1978**

Occupation or position held Assistant lecturer, Physics Chair

Main activities and responsibilities Laboratory works in the field of laser physics and general physics

Name and address of employer Polytechnic University Bucharest
Type of business Teaching

Dates **1970-1988**
 Occupation or position held Researcher, Laser Department, Solid-State Laser Laboratory
 Main activities and responsibilities - Study and development of solid-state laser systems.
 - Laser applications in industry (materials processing) and medicine.
 - Responsible of a national project for Laser Application in Ophthalmology
 Name and address of employer Institute of Atomic Physics, Bucharest - Magurele
 Type of business or sector Scientific Research

Dates **1967-1970**
 Occupation or position held Engineer, High-Energies Laboratory
 Main activities and responsibilities Electronic devices for scientific research
 Name and address of employer Institute of Atomic Physics, Bucharest - Magurele
 Type of business or sector Scientific Research

Education and training

Dates **1970-1977**
 Title of qualification awarded Doctor Engineer
 Principal subjects/occupational skills covered *"Contributions to the study of a short-pulsed Ruby laser"* – doctor's degree thesis
 - Physics and Engineering of the solid-state lasers.
 - Passively and actively Q-switched nanosecond pulsed lasers.
 - Pulsed laser amplifiers.
 Name and type of organisation providing education and training Central Institute of Physics, Bucharest - Magurele

Dates **1961-1966**
 Title of qualification awarded Engineer
 Principal subjects/occupational skills covered Electronics and Physics
 Name and type of organisation providing education and training Polytechnic University Bucharest, Faculty of Electronics and Telecommunications

Personal skills and competences

Mother tongue(s) **Romanian**

Other language(s)

Self-assessment

European level (*)

English

French

Russian

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken production			
B2	Independent user	C1	Proficient user	B2	Independent user	B2	Independent user	C1	Proficient user
B2	Independent user	C1	Proficient user	B1	Independent user	B1	Independent user	C1	Proficient user
B1	Independent user	B2	Independent user	B1	Independent user	B1	Independent user	B1	Independent user

(*) [Common European Framework of Reference for Languages](http://www.cedefop.europa.eu/en/intermediate)

Social skills and competences Very good communication skills and team spirit, gained as a laboratory head and by teaching at the university.

Organisational skills and competences

Responsible on behalf of ELI-NP of the collaboration project "Toward the Zeptosecond regime" between IFIN-HH and IZEST, Ecole-Polytechnique, Paris, in the field of femtosecond pulses post-compression in thin films (2014-2017).

Responsible of WP7A „Lasers" on behalf of the Romanian team in the frame of the European project FP7: „Extreme Light Infrastructure-Preparatory Phase", ELI-PP (2007-2010, www.extreme-light-infrastructure.eu).

Director of 7 national and international scientific projects in the period 2002-2010.

Head of the Romanian Contractor NILPRP team which participated in the FP5 European Project „*Laseract*", led by FORTH-IESL, Heraklion, Greece, dedicated to laser application in the preservation of the European cultural heritage (2003-2006).

Director of two national *Capacities* projects (2007-2011) for the development of a high-power femtosecond laser facility, which includes a 10-TW laser (TEWALAS, <http://ssll.inflpr.ro>), currently in operation in NILPRP.

Director of the national project "Advanced femtosecond laser system for materials and photonic crystals nanostructuring"-FEMAT, 2007-2010.

Head of the Solid-State Laser Laboratory from the Laser Department, NILPRP (1988-2013).

Technical skills and competences

Design and construction of various types of pulsed solid-state laser oscillators and amplifiers

Design of a multi-pass Ti:sapphire laser amplifier for upgrading a multi-TW femtosecond laser system from the Optical Laboratory of ELI-NP.

Participation in the elaboration of the laser architecture of the Romanian ELI pillar, Nuclear Physics (ELI-NP). Co-author of the ELI-NP White Book (<http://www.eli-np.ro/documents/ELI-NP-WhiteBook.pdf>).

Design and construction, in collaboration with Prooptica Bucharest, of a single longitudinal mode nanosecond frequency doubled Nd:YAG laser system (oscillator and amplifier) for holography measurements at FORTH-IESL Heraklion, Greece (in the frame of *Laseract* FP5 Project).

Development of Ruby, Nd:glass, and Nd:YAG pulsed lasers for the research activity in NILPRP.

Nonlinear optics (harmonics generators, auto-correlators, parametric oscillators/amplifiers)

Design of a single shot auto-correlator for femtosecond pulses duration measurement

Development of eye-safe intracavity pumped parametric oscillators

Studies of harmonics generation in nonlinear crystals pumped by nanosecond Nd:YAG and femtosecond Ti:sapphire lasers.

Technological and medical/biological laser applications.

Design and construction of a nanosecond Nd:YAG laser device coupled to a biomicroscope for the eye microsurgery, delivered by NILPRP to several clinics from Romania in the years 1985-1989.

Participation in the design and construction of the optical lighting and detection system of an electro-plasmonic analysis system (in the frame of *BioScope* national research project, led by the International Centre of Biodynamics, Bucharest, 2011-2013), OSIM patent No. 132361.

Design and construction of a passively Q-switched Nd:YAG laser with unstable resonator for material surface cleaning.

Participation in research and development projects of pulsed solid-state lasers for technological applications: cutting of semiconductor wafers, resistors trimming, sapphire drilling.

Computer skills and competences	Operating System Windows; Microsoft Office Programs: Mathematica, SNLO.
Driving licence	B
Additional information	<p>Author of 93 publications in Web of Science, with more than 670 citations (information available on www.researcherid.com).</p> <p>Author of two books (in Romanian language): <i>"Extreme Light – High-power Lasers"</i>, Publishing House of the Romanian Academy, 2015 <i>"Fundamentals of Nonlinear Optics"</i>, Publishing House of the Bucharest University, 2005.</p> <p>Author / co-author of four chapters included in scientific books: R. Dabu, <i>"High-power, high intensity contrast hybrid femtosecond laser systems"</i>, in <i>High Power Laser Systems</i>, ISBN 978-953-51-5267-5, published by InTech, Croatia, 2018. F. Jipa, M. Zamfirescu, A. Velea, M. Popescu, R. Dabu, Chapter 3 – <i>"Femtosecond Laser Lithography in Organic and Non-Organic Materials"</i>, in <i>Updates in Advanced Lithography</i>, InTech ISBN 978-953-51-1175-7, July 2013. M. Zamfirescu, M. Ulmeanu, A. Bunea, G. Sajin, R. Dabu, Chapter 14 – <i>"Ultrashort Pulsed Lasers-Efficient Tools for Materials Micro-Processing"</i>, 261-268, in <i>Recent Advances in Nanofabrication Techniques and Applications</i>, InTech, Rijeka, 2011. R. Dabu, <i>"Optical Parametric Oscillators and Amplifiers"</i> in <i>Encyclopedia of Optical Engineering</i>, published online by Marcel Dekker, New York, 2004.</p> <p>Participation in conferences in the last 10 years: Author of 39 presentations in international conferences, workshops, and summer/autumn schools; 18 of these presentations were invited talks.</p> <p>Co-author of 5 OSIM patents.</p> <p>May-June 1997, May-November 2000: Research stages at Tohoku University, Sendai, Japan - Femtosecond lasers and their application in material processing</p> <p>September-November 2002: Invited researcher at Yamagata University, Yonezawa, Japan - Lasers for Optical Coherence Tomography</p> <p>January-March 2004: Invited researcher at Putra University, Serdang, Malaysia - Nanosecond laser systems and applications in material processing</p> <p>Prize „<i>Dragomir Hurmuzescu</i>” of the Romanian Academy, 1981, for „<i>High power lasers for plasma generation and diagnosis, processing and treatment of metals</i>”</p> <p>Senior Member of the Optica (former OSA) Society</p> <p><i>Reviewer</i>: Applied Optics, Optics Express, Optical Engineering, Optics and Laser Technology, Journal of Applied Physics:D, Nature Photonics, Optik, High Power Laser Science and Engineering, JOSA B.</p> <p>My current main interest is in the ultrafast laser systems engineering and nonlinear optics, particularly the development of high-power femtosecond laser amplifiers, harmonic generators and optical parametric devices, as well as technological (micro-processing and nano-structuring of materials) and bio-medical applications of ultra-short pulsed lasers.</p>

List of the last 10-years published papers

1. 10 PW peak power femtosecond laser pulses at ELI-NP

Radier, C; Chalus, O; Charbonneau, M; Thambirajah, S; Deschamps, G; David, S; Barbe, J; Etter, E; Matras, G; Ricaud, S; Leroux, V; Richards, C; Lureau, F; Baleanu, A; Banici, R; Gradinariu, A; Caldararu, C; Capiteanu, C; Naziru, A; Diaconescu, B; Iancu, V; **Dabu, R**; Ursescu, D; Dancus, I; Ur, CA; Tanaka, KA; Zamfir, NV.
High Power Laser Science and Engineering **10** e21 (2022)

2. Compressing High Energy Lasers through Optical Polymer Films

Wheeler, J; Bleotu, GP; Naziru, A; Fabbri, R; Masruri, M; Secareanu, R; Farinella, DM; Cojocar, G; Ungureanu, R; Baynard, E; Demailly, J; Pittman, M; **Dabu, R**; Dancus, I; Ursescu, D; Ros, D; Tajima, T; Mourou, G.
Photonics, **9** (10), 715 (2022).

3. Optical parametric amplification at critical wavelength degeneracy - a proposed approach for 100-PW class femtosecond laser development.

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OSA Continuum **4** (5), 1658 (2021).

4. High-energy hybrid femtosecond laser system demonstrating 2x10 PW capability

François Lureau, Guillaume Matras, Olivier Chalus, Christophe Derycke, Thomas Morbieu, Christophe Radier, Olivier Casagrande, Sébastien Laux, Sandrine Ricaud, Gilles Rey, Alain Pellegrina, Caroline Richard, Laurent Boudjema, Christophe Simon-Boisson, Andrei Baleanu, Romeo Banici, Andrei Gradinariu, Constantin Caldararu, Bertrand De Boisdreffre, Petru Ghenuche, Andrei Naziru, Georgios Kolliopoulos, Liviu Neagu, **Razvan Dabu**, Ioan Dancus, Daniel Ursescu,
High Power Laser Science and Engineering **8** e43 (2020)

5. Upgrading design of a multi-TW femtosecond laser

V Aleksandrov, G Bleotu, L Caratas, **R Dabu**, I Dancus, R Fabbri, V Iancu, B Ispas, M Kiss, A Lachapelle, A Lazar, M Masruri, D Matei, M Merisanu, V Mohanan, A Naziru, D Nistor, R Secareanu, M Talposi, A Toader, A Toma, D Ursescu
Romanian Reports in Physics **72** (4) 413 (2020)

6. Focusability of laser pulses at petawatt transport intensities in thin-film compression

Farinella, DM; Wheeler, J; Hussein, AE; Nees, J; Stanfield, M; Beier, N; Ma, Y; Cojocar, G; Ungureanu, R; Pittman, M; Demailly, J; Baynard, E; Fabbri, R; Masruri, M; Secareanu, R; Naziru, A; **Dabu, R**; Maksimchuk, A; Krushelnick, K; Ros, D; Mourou, G; Tajima, T; Dollar, F.
Journal of the Optical Society of America B, **36** (2), A28-A32 (2019)

7. Optical Thin Film Compression for Laser Induced Plasma Diagnostics

Masruri, M; Wheeler, J; Dancus, I; Fabbri, R; Naziru, A; Secareanu, R; Ursescu, D; Cojocar, G; Ungureanu, R; Farinella, D; Pittman, M; Mironov, S; Balascuta, S; Doria, D; Ros, D; **Dabu, R**.
Proceedings of the Conference on Lasers and Electro-Optics (CLEO) 2019, Published 2019.

8. Femtosecond Laser Pulses Amplification in Crystals

Dabu, Razvan

Crystals, **9** (7), 347 (2019)

9. X-Rays Driven by Single-Cycle, Petawatt Lasers: A Path to Exawatt Pulses

Wheeler, J; Cojocar, G; Ungureanu, R; Banici, R; Gonin, R; Mironov, S; Serbanescu, M; **Dabu, R**; Mourou.
Springer Proceedings in Physics of the 15th International Conference on X-Ray Lasers (ICXRL), Vol. 202, 143-147 (2018).

10. 100 J-level pulse compression for peak power enhancement

Mironov, S; Wheeler, J; Gonin, R; Cojocar, G; Ungureanu, R; Banici, R; Serbanescu; **Dabu, R**; Mourou, G; Khazanov, EA.
Quantum Electronics, **47** (3), 173-178 (2017)

11. High Power, High Contrast Hybrid Femtosecond Laser Systems

Dabu, Razvan

AIP Conference Proceedings, EXOTIC NUCLEI AND NUCLEAR/PARTICLE ASTROPHYSICS (VI): PHYSICS WITH SMALL ACCELERATORS, Vol. 1852, Article Number 070001 (2017)

12. Laser beam delivery at ELI-NP

Ursescu, D; Cheriaux, G; Audebert, P; Kalashnikov, M; Toncian, T; Cerchez, M; Kaluza, M; Paulus, G; Priebe, G; **Dabu, R**; Cernaianu, MO; Dinescu, M; Asavei, T; Dancus, I; Neagu, L; Boianu, A; Hooker, C; Barty, C; Haefner, C.

13. Transient Collisionally Excited X-ray Lasers Pumped with One Long and Two Short Pulses

Ursescu, D; Cojocaru, G; Ungureanu, R; Banici, R; Ionel, L; Simion, S; **Dabu, R**; Tummeler, J; Jung, R; Stiel, H; Delmas, O; Pittman, M; Guilbaud, O; Kazamias, S; Cassou, K; Demailly, J; Neveu, O; Baynard, E; Ros, D; Le Marec, A; Daboussi, S; Lu, L; Klisnick, A; Zeitoun, P. *Springer Proceedings in Physics*, 14th International Conference on X-Ray Lasers, Vol. **169**, 53-59 (2016).

14. High Power Hybrid Femtosecond Laser Systems

Dabu, Razvan

Romanian Reports in Physics, **67** (4), 1225-1243 (2015)

15. High Power Femtosecond Lasers at ELI-NP

Dabu, Razvan

AIP Conference Proceedings, Vol. **1645**, 219-227 (2015)

16. Laser parallel nanofabrication by single femtosecond pulse near-field ablation using photoresist masks

Jipa, F; Dinescu, A; Filipescu, M; Anghel, I; Zamfirescu, M; **Dabu, R**.

Optics Express, **22** (3), 3356-3361 (2014)

17. Femtosecond laser ablation of TiO₂ films for two-dimensional photonic crystals

Anghel, I; Jipa, F; Andrei, A; Simion, S; **Dabu, R**; Rizea, A; Zamfirescu, M.

Optics and Laser Technology, **52**, 65-69 (2013)

18. Spectroscopic study of gold nanoparticle formation through high intensity laser irradiation of solution

Nakamura, T; Herbani, Y; Ursescu, D; Banici, R; **Dabu, R**; Sato, S.

AIP Advances Vol. 3, no. 8, Article number 082101, (2013)

19. Extreme Light Infrastructure – Nuclear Physics

O. Tesileanu, D. Ursescu, **R. Dabu**, N.V. Zamfir

Journal of Physics Conference Series, **420**, Article number 012157, (2013)

20. Materials micro-processing using femtosecond lasers

Dabu, R; Zamfirescu, M; Anghel, I; Jipa, F.

Proceedings of SPIE, **8882**, Article number 888207 (2013)

List of some other significant published papers

1. Pump energy reduction for a high gain Ag X-ray laser using one long and two short pump pulses

Romeo A. Banici, Gabriel V. Cojocaru, Razvan G. Ungureanu, **Razvan Dabu**, Daniel Ursescu, and Holger Stiel,

Optics Letters **37**, Issue 24, 5130-5132 (2012).

2. Terawatt laser system irradiation of carbon/tungsten bilayers

C.P.Lungu, A. Marcu, C. Porosnicu, I. Jepu, A. M. Lungu, P. Chiru, C. Luculescu, R. Banici, D. Ursescu, **R. Dabu**, I. D. Feraru, C. E. A. Grigorescu, G. Iacobescu, M. Osiac, J. Kovač, V Nemanič, I. Hinkov, S. Farhat, A. Gicquel and O. Brinza.

Physica Status Solidi A **209** (9), 1732–1737 (2012).

3. Very broad gain bandwidth parametric amplification in nonlinear crystals at critical wavelength degeneracy

R. Dabu

Optics Express, **18**, 11689-11699 (2010).

4. Layout for millimeter wave Composite Right/Left-Handed devices obtained by femtosecond laser ablation

M. Zamfirescu, G. Sajin, A. Bunea, F. Craciunoiu, S. Simion, **R. Dabu**

J. Opt. Adv. Mat. **12** (3), 686-691 (2010).

5. High-aspect-ratio structures produced by two-photon photopolymerization

F. Jipa, M. Zamfirescu, C. Luculescu, **R. Dabu**

J. Opt. Adv. Mat. **12** (1) 124-128 (2010).

6. Laser processing and characterization with femtosecond laser pulses

M. Zamfirescu, M. Ulmeanu, F. Jipa, I. Anghel, S. Simion, **R. Dabu**, I. Ionita

Romanian Reports in Physics **62**, No. 3, 594-609 (2010).

7. TEWALAS 20-TW femtosecond laser facility

R. Dabu, R. Banici, C. Blanaru, C. Fenic, L. Ionel, F. Jipa, L. Rusen, S. Simion, A. Stratan, M. Ulmeanu, D. Ursescu, M. Zamfirescu, *J. Opt. Adv. Mat.* **12**, Issue 1, 35-38 (2010).

8. Extreme Light Infrastructure: architecture and major challenges

Chambaret, JP; Chekhlov, O; Cheriaux, G; Collier, J; **Dabu, R**; Dombi, P; Dunne, AM; Ertel, K; Georges, P; Hebling, J; Hein, J; Hernandez-Gomez, C; Hooker, C; Karsch, S; Korn, G; Krausz, F; Le Blanc, C; Major, Z; Mathieu, F; Metzger, T; Mourou, G; Nickles, P; Osvay, K; Rus, B; Sandner, W; Szabo, G; Ursescu, D; Varju, K.

Proceedings of SPIE, Vol. **7721**, Article Number 77211D (2010).

9. In vivo imaging of dynamic biological specimen by real-time single-shot full-field optical coherence tomography

M. S. Hrebesh, **R. Dabu**, M. Sato

Opt. Communications **282**, 674–683 (2009).

10. Structuring by field enhancement of glass, Ag, Au and Co thin films using short pulse laser ablation

M. Ulmeanu, M. Zamfirescu, L. Rusen, C. Luculescu, A. Molodovan, A. Stratan, **R. Dabu**

Journal of Applied Physics, Vol. **106**, Issue 11, Article Number: 114908 (2009)

11. Femtosecond Laser Induced Periodic Surface Structures on ZnO Thin Films

M. Zamfirescu, M. Ulmeanu, F. Jipa, O. Cretu, A. Moldovan, G. Epurescu, M. Dinescu, **R. Dabu**

Journal of Laser Micro/NanoEngineering **4**, 7-10 (2009).

12. Femtosecond Laser Fabrication of Metamaterials for High Frequency Microwave Devices

M. Zamfirescu, **R. Dabu**, M. Dumitru, G. Sajin, F. Craciunoiu

Journal of Laser Micro/NanoEngineering **3** (1), 5-8 (2008).

13. Quadrature fringes wide-field optical coherence tomography and its applications to biological tissues

M. Sato, T. Nagat, T. Niizuma, L. Neagu, **R. Dabu**, Y. Watanabe

Optics Communications, Vol. **271**, 573-580 (2007).

14. Compact eye-safe sources based on OPO's with KTP and PPKTP crystals

L. Neagu, C. Ungureanu, **R. Dabu**, A. Stratan, C. Fenic, L. Rusen

Optics and Laser Technology, Vol. **39**, 973-979 (2007).

15. Preliminary studies of material surface cleaning with a multi-pulse passively Q-switched Nd:YAG laser

C. Fenic, **R. Dabu**, A. Stratan, C. Blanaru, C. Ungureanu, C. Luculescu

Optics and Laser Technology, Vol. **36**, 125-130 (2004).

16. Eye-safe singly resonant KTP parametric oscillator pumped inside a Nd:YAG laser cavity

R. Dabu, A. Stratan, C. Fenic, C. Luculescu, L. Muscalu

Opt. Eng. **40**(3), 455-459 (2001).

17. Intracavity pumped nanosecond optical parametric oscillator emitting in the eye-safe range

R. Dabu, C. Fenic, A. Stratan

Applied Optics, Vol. **40** (24), 4334-4340 (2001).

18. Tunable doubly resonant optical parametric oscillator with LBO and KTP crystals pumped by second harmonic of a nanosecond Nd:YAG laser

R. Dabu, C. Fenic, A. Stratan, C. Luculescu, L. Muscalu

Optica Applicata, Vol. **28**, No. 2, 115-126 (1998).

19. Photoacoustic evidence of target ablation for LPVD of YBCO thin films

I. Apostol, R. Stoian, **R. Dabu**, A. Stratan

Applied Surface Science **136**, 166-171 (1998).

20. A model of the metallic surface emitting second harmonic generator

A. Popa, M. Lazarescu, **R. Dabu**, A. Stratan

IEEE Journal of Quantum Electronics, Vol. **33**, No. 9, 1474 – 1480 (1997).

21. Evaluation of the efficiency of harmonic generation in nonlinear crystals with 1064 nm Gaussian laser pulses

R. Dabu, C. Fenic, A. Stratan, L. Muscalu

Optica Applicata, Vol. **26**, No.3, 171-183 (1996).