

GRIGORE LEAHU

Curriculum Vitae

General Information

Full Name	Grigore Leahu
Date of Birth	25/03/1952
Place of Birth	Petreni, Drochia, Republic of Moldova
Citizenship	Italian
Permanent Address	Via Albona n. 95A pal.B , Roma 00177 (RM), Italy
Mobile Phone Number	371 3273155
E-mail	grigore.leahu@uniroma1.it
Spoken Languages	Moldavian, Russian, Italian

Education

Type	Year	Institution	Notes (Degree, Experience,...)
PhD	1995	Università degli Studi di ROMA "La Sapienza"	PhD in the Applied Electromagnetism and Electrophysics
PhD	1982	Academy of Sciences of the Republic of Moldova	PhD in the Semiconductors and Dielectrics Physics
Master of science (M.Sc.)	1974	Università Tecnica di Chisinau, Republic of Moldova	degree in Electronic Engineering, grade 5/5 (110/110)

Academic Appointments

Start	End	Institution	Position
01/02/20	present	Università degli Studi di ROMA "La Sapienza"	Self-employment contract
01/02/19	31/01/20	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/02/18	31/01/19	Università degli Studi di ROMA "La Sapienza"	Research grant holder

01/02/17	31/01/18	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/02/16	31/01/17	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/02/2015	31/01/2016	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/02/14	31/01/2015	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/02/2013	31/01/2014	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/02/2012	31/01/2013	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/02/2011	31/01/2012	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/02/2010	31/01/2011	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/08/2008	31/01/2010	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/07/2006	30/06/2008	Università degli Studi di ROMA "La Sapienza"	Research grant holder
01/01/2000	31/12/2005	Università degli Studi di ROMA "La Sapienza"	Term-contract worker, research activity
01/03/1998	30/06/1998	Università degli Studi di ROMA "La Sapienza"	Research scholarship for the scientific activity within NATO-CNR-Guest Fellowships Programme for Physics (No. 219.29)
01/01/1996	31/12/1997	Università degli Studi di ROMA "La Sapienza"	Post-doc scholarship
01/02/1989	31/12/1992	Università degli Studi di ROMA "La Sapienza"	Research scholarship from the Italian Ministry of Foreign Affairs within the bilateral scientifically cultural agreement between Italy and URSS
1974	1988	Università Tecnica di Chisinau, Republic of Moldova	Research activity

Research Activities

Keywords

Brief Description

Semiconductors Electrophysical parameters Hall effect Photothermal techniques, radiometry Photoacoustic spectroscopy Nanostructures, Solar cells	Forty years of the continuous scientific research can be divided into two distinct periods and research paths: 1974-1988 the research was done in the Microelectronics Laboratory at the Faculty of Electrophysics (Technical University of Moldova, Chisinau); since 1988 the research has been done in the Photothermal Techniques Laboratory at the Sapienza University of Rome. In the Microelectronics Laboratory initially he had investigated the fabrication of the epitaxial films of A3B5 semiconductors for microelectronics and optoelectronics. In order to elaborate the optimal technology for the semiconductor growth and guarantee the desired characteristics, it is fundamental to rigorously control the electrophysical properties of the product; above all, the concentration of the free charge carriers and their mobility. The later period of his scientific activity started in the beginning of January 1989, at the Department of Energetics, where he obtained a scholarship from the Italian Ministry of the Foreign Affairs within the bilateral scientifically-cultural agreement between Italy and URSS. The scientific activity has predominantly been dedicated to the studies of the heat transport processes in different materials and electronic devices, and to the measurement methodologies based on lasers. The experimental part of the research has been mostly based on the photothermal techniques: the photothermal deflection, the photothermal spectroscopy and the photothermal radiometry. The studies carried out have developed, from one side, a more profound understanding of some fundamental methodological aspects of the photothermal deflection technique for the determination of the thermal parameters of the solid materials studied, and from the other side, the research has led to the use of the technique for innovative applications. Over the last few years, the chiral properties of polystyrene nanospheres partially covered with gold have been studied, with different measurement techniques (i); the effect of thermal photo deflection in partially gold-covered polystyrene nanospheres was studied, in particular the chiral effect. The results obtained show that the samples present a marked circular dichroism induced by geometry and therefore it is hypothesized that they can be used for the recognition of chiral biological molecules.
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He obtained 9 invention patents:

1. Molodean Ivan Petrovici, **Leahu Grigore Liostinovici** e Korotcencov Ghenadij Sergheevici:
"Dispositivo per la misurazione della variazione in temperatura della resistività di semiconduttori",
Brevetto URSS Nr. 712785, priorità del 13 giugno 1978(*traduzione dal russo*)

Молодян Иван Петрович, **Ляху Григорий Лиостинович** и Коротченков Геннадий Сергеевич: “Устройство для измерения температурной зависимости удельного сопротивления полупроводниковых пластин”, Авторское свидетельство СССР № 712785, приоритет от 13 июня 1978. (in russo).

2. **Leahu Grigore Liostinovic**, Molodean Ivan Petrovici e Korotcencov Ghenadij Sergheevici: “Dispositivo per la misurazione della variazione in temperatura della mobilità di Hall nei materiali semiconduttori”, Brevetto URSS Nr. 788053, priorità del 17 luglio 1978 (*traduzione dal russo*)

Ляху Григорий Лиостинович, Молодян Иван Петрович и Коротченков Геннадий Сергеевич: “Устройство для измерения температурной зависимости холловской подвижности носителей заряда в полупроводниковых материалах”, Авторское свидетельство СССР № 788053, приоритет от 17 июля 1978г. (in russo).

3. **Leahu Grigore Liostinovic**, Molodean Ivan Petrovici, Sirbu Alexei Vasilievici, Iakovlev Vladimir Pavlovici e Korotcencov Ghenadij Sergheevici: “Sensore Hall”, Brevetto URSS Nr. 843664, priorità del 12 febbraio 1980 (*traduzione dal russo*).

Ляху Григорий Лиостинович, Молодян Иван Петрович, Сырбу Алексей Васильевич, Яковлев Владимир Павлович и Коротченков Геннадий Сергеевич: “Датчик Холла”, Авторское свидетельство СССР № 843664, приоритет от 12 февраля 1980г. (in russo).

4. **Leahu Grigore Liostinovic**, Korotcencov Ghenadij Sergheevici, Molodean Ivan Petrovici e Kazacu Viorel Feodorovici: “Sensore Hall”, Brevetto URSS Nr. 849943, priorità del 16 aprile 1980 (*traduzione dal russo*).

Ляху Григорий Лиостинович, Коротченков Геннадий Сергеевич, Молодян Иван Петрович и Казаку Виорел Фёдорович: “Датчик Холла”, Авторское свидетельство СССР № 849943, приоритет от 16 апреля 1980г. (in russo).

5. **Leahu Grigore Liostinovic**, Molodean Ivan Petrovici e Korotcencov Ghenadij Sergheevici: “Dispositivo per la misurazione della variazione in temperatura dei coefficienti cinetici nei materiali semiconduttori”, Brevetto URSS Nr. 774391, priorità del 7 maggio 1979 (*traduzione dal russo*).

Ляху Григорий Лиостинович, Молодян Иван Петрович и Коротченков Геннадий Сергеевич: “Устройство для измерения температурной зависимости кинетических коэффициентов полупроводниковых материалов”, Авторское свидетельство СССР № 774391, приоритет от 7 мая 1979г. (in russo).

6. **Leahu Grigore Liostinovic**, Korotcencov Ghenadij Sergheevici, Molodean Ivan Petrovici e Ciurac Valentin Alexandrovici: “Sensore Hall”, Brevetto URSS Nr. 922666, priorità del 21 marzo 1980 (*traduzione dal russo*).

Ляху Григорий Лиостинович, Коротченков Геннадий Сергеевич, Молодян Иван Петрович и Чумак Валентин Александрович: “Датчик Холла”, Авторское свидетельство СССР № 922666, приоритет от 21 марта 1980г. (in russo).

7. **Leahu Grigore Liostinovici**, Korotcencov Ghenadij Sergheevici, Molodean Ivan Petrovici e Bescliu Vasiliu Semionovici: “Dispositivo per la misurazione della forza elettromotrice di Hall”, Brevetto URSS Nr. 898356, priorità del 20 maggio 1980 (*traduzione dal russo*).

Ляху Григорий Лиостинович, Коротченков Геннадий Сергеевич, Молодян Иван Петрович и Бешлиу Василий Семёнович: “Устройство для измерения электродвижущей силы Холла”, Авторское свидетельство СССР № 898356, приоритет от 20 мая 1980г. (*in russo*).
8. Korotcencov Ghenadij Sergheevici, Zvitzinskij Victor Iosifovici e **Leahu Grigore Liostinovici**: “Metodo di investigazione delle lamine di semiconduttori” Brevetto URSS Nr. 1112950, priorità del 4 maggio 1983 (*traduzione dal russo*).

Коротченков Геннадий Сергеевич, Цвицинский Виктор Иосифович и **Ляху Григорий Лиостинович**: “Способ исследования полупроводниковых пластин”, Авторское свидетельство СССР № 1112950, приоритет от 4 мая 1983г. (*in russo*).
9. Korotcencov Ghenadij Sergheevici, Zvitzinskij Victor Iosifovici e **Leahu Grigore Liostinovici**: “Metodo di formazione delle coperture metalliche sugli substrati di semiconduttori” (*traduzione dal russo*).

Коротченков Геннадий Сергеевич, Цвицинский Виктор Иосифович и **Ляху Григорий Лиостинович**: “Способ формирования металлических покрытий на полупроводниковых подложках”, Авторское свидетельство СССР № 1112950, приоритет от 4 мая 1983г. (*in russo*).

Selected Publications

- 1) Paweł Osewski, Alessandro Belardini, Marco Centini, Constantinos Valagiannopoulos, **Grigore Leahu**, Roberto Li Voti, Monika Tomczyk, Andrea Alù, Dorota Pawlak, Concita Sibilìa, “New Self-Organization Route to Tunable Narrowband Optical Filters and Polarizers Demonstrated with ZnO–ZnWO₄ Eutectic Composite” Advanced Optical Materials, First published: 10 January 2020, doi:10.1002/adom.201901617.
- 2) Cesca T., Scian C., Petronijevic E., **Leahu G.**, Li Voti R., Cesarini G., Macaluso R., Mosca M., Sibilìa C., Mattei G. (2020). Correlation between in-situ structural and optical characterizations of the semiconductor-to-metal phase transition of VO₂ thin films on sapphire. Nanoscale, vol.12, P.851-863, ISSN:2040-3364, doi: 10.1039/c9nr09024j
- 3) E. Petronijevic, H. Ali, N. Zaric, A. Belardini, **G. Leahu**, T. Cesca, G. Mattei, L. C. Andreani, C. Sibilìa (2020). Chiral effects in low-cost plasmonic arrays of elliptic nanoholes. OPTICAL AND QUANTUM ELECTRONICS, ISSN: 0306-8919, doi: 10.1007/s11082-020-02279-8
- 4) Belardini A., **Leahu G.**, Petronijevic E., Hakkarainen T., Koivusalo E., Piton M. R., Talmila S., Guina M., Sibilìa C. (2020). Circular dichroism in the second harmonic field evidenced by asymmetric Au coated GaAs nanowires. MICROMACHINES, vol. 11, p. 1-8, ISSN: 2072-666X, doi: 10.3390/mi11020225
- 5) E. Petronijevic, A. Belardini, **G. Leahu**, T. Cesca, C. Scian, G. Mattei, C. Sibilìa (2020). Circular dichroism in low-cost plasmonics: 2D arrays of nanoholes in silver. APPLIED SCIENCES, ISSN: 2076-3417, doi: 10.3390/app10041316
- 6) E. Petronijevic, **G. Leahu**, R. Li Voti, A. Belardini, C. Scian, N. Michieli, T. Cesca, G. Mattei, and C. Sibilìa. (2019). Photo-acoustic detection of chirality in metal-polystyrene metasurfaces. Appl. Phys. Lett. 114, p.053101-1-053101-5 (2019); doi: 10.1063/1.5064514.

- 7) E. PETRONIJEVIC, **G. LEAHU**, V. DI MEO, A. CRESCITELLI, P. DARDANO, G. COPPOLA, E. ESPOSITO, I. RENDINA, M. MIRITELLO, M.G. GRIMALDI, V. TORRISI, G. COMPAGNINI, AND C. SIBILIA. Near-infrared modulation by means of GeTe/SOI-based metamaterial, *Optics Letters*, 1508 Vol. 44, No. 6 / 15 March 2019.
- 8) **Leahu, G.**, Belardini, A., Petronijevic, E., Voti, R.L., Sibilia, C., Cesca, T., Mattei, G. Thermal scan of metal based metasurface and evidence of circular dichroism and optothermal anisotropy. 2018 Conference on Lasers and Electro-Optics, CLEO 2018 - Proceedings 6 August 2018, Article number 84269232018 Conference on Lasers and Electro-Optics, CLEO 2018; San Jose; United States; 13 May 2018 through 18 May 2018; Category number CFP18CLE-ART; Code 138552.
- 9) E. Petronijevic, · **G. Leahu**, · A. Belardini, M. Centini, R. Li Voti, T. Hakkarainen, E. Koivusalo, · M. Guina, C. Sibilia, Resonant Absorption in GaAs-Based Nanowires by Means of Photo-Acoustic Spectroscopy, *Int J Thermophys* (2018) doi.org/10.1007/s10765-018-2365-4, ICPPP 19
- 10) E. Petronijevic, **G. Leahu**, A. Belardini, M. Centini, R. Li Voti, T. Hakkarainen, E. Koivusalo, · M. Rizzo Piton, · S. Suomalainen, M. Guina end · C. Sibilia. Photo-Acoustic Spectroscopy Reveals Extrinsic Optical Chirality in GaAs-Based Nanowires Partially Covered with Gold. *Int J Thermophys* (2018) doi.org/10.1007/s10765-018-2367-2, ICPPP 19
- 11) Gianmario Cesarini, **Grigore Leahu**, Roberto Li Voti, Concita Sibilia. Long-wave infrared emissivity characterization of vanadium dioxide-based multilayer structure on silicon substrate by temperature-dependent radiometric measurements, *Infrared Physics and Technology* 93 (2018) 112–115
- 12) **Grigore Leahu**, Emilija Petronijevic, Alessandro Belardini, Marco Centini, Concita Sibilia, Teemu Hakkarainen, Eero Koivusalo, Marcelo Rizzo Piton, Soile Suomalainen, and Mircea Guina. Evidence of Optical Circular Dichroism in GaAs-Based Nanowires Partially Covered with Gold. *Adv. Optical Mater.* 2017, 1601063 (2017).
- 13) **Grigore Leahu**, Emilija Petronijevic, Alessandro Belardini, Marco Centini, Roberto Li Voti, Teemu Hakkarainen, Eero Koivusalo, Mircea Guina, Concita Sibilia. Photo-acoustic spectroscopy revealing resonant absorption of self-assembled GaAs-based nanowires. *Sci. Rep.* 7, 2833 (2017).
- 14) Pawel Osewski, Alessandro Belardini, Emilija Petronijevic, Marco Centini, **Grigore Leahu**, Ryszard Diduszko, Dorota A. Pawlak, Concita Sibilia. Self-Phase-Matched Second-Harmonic and White-Light Generation in a Biaxial Zinc Tungstate Single Crystal. *Scientific Reports* 7, 45247 (2017). doi:10.1038/srep45247
- 15) A. Belardini, **G. Leahu**, M. Centini, R. Li Voti, E. Fazio, C. Sibilia, D. Repetto, F. Buatier de Mongeot. Second harmonic generation on self-assembled GaAs/Au nanowires with thickness gradient. *Proc.* 10228, 102280L (2017).
- 16) Laura Fontana, Ilaria Fratoddi, Roberto Matassa, Giuseppe Familiari, Iole Venditti, Chiara Batocchio, Elena Magnano, Silvia Nappini, **Grigore Leahu**, Alessandro Belardini, Roberto Li Voti, Concita Sibilia. Hybrid metal-organic conductive network with plasmonic nanoparticles and fluorene (Conference Presentation). *Proc. SPIE* 10227, 102270Q (2017).
- 17) Emilija Petronijevic, Marco Centini, Alessandro Belardini, **Grigore Leahu**, Teemu Hakkarainen, and Concita Sibilia, "Chiral near-field manipulation in Au-GaAs hybrid hexagonal nanowires," *Opt. Express* 25, 14148-14157 (2017).
- 18) Alessio Benedetti, Badrul Alam, Marco Esposito, Vittorianna Tasco, **Grigore Leahu**, Alessandro Belardini, Roberto Li Voti, Adriana Passaseo, Concita Sibilia. "Precise detection of circular dichroism in a cluster of nano-helices by photoacoustic measurements". *Sci. Rep.* 7, 5257 (2017).
- 19) F.R. Lamastra, M.L. Grilli, **G. Leahu**, A. Belardini, R. Li Voti, C. Sibilia, D. Salvatori, I. Cacciotti, F. Nanni. "Diatom frustules decorated with zinc oxide nanoparticles for enhanced optical properties". *Nanotechnology* (2017). DOI: 10.1088/1361-6528/aa7d6f
- 20) A. Belardini, **G. Leahu**, M. Centini, R. Li Voti, E. Fazio, C. Sibilia, J. W. Haus, A. Sarangan, D. Hooper, V. K. Valev, "Effective chiral behavior on self-assembled tilted gold nanowires metasurface by means of linear and nonlinear optical techniques", *Proc. SPIE* 9894, 98941V (2016).
- 21) R. Matassa, G. Familiari, E. Battaglione, C. Sibilia, **G. Leahu**, A. Belardini, I. Venditti, L. Fontana, I. Fratoddi. Electron microscopy reveals a soluble hybrid network of individual nanocrystals self-anchored by bifunctional thiol fluorescent bridges. *Nanoscale* 8 (42), 18161-18169 (2016).
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- 23) Alessandro Belardini, Marco Centini, **Grigore Leahu**, Eugenio Fazio, Concita Sibilia, Joseph W.

- Haus and Andrew Sarangan, "Second harmonic generation on self-assembled tilted gold nanowires", *Faraday Discuss.* 178, 357-362 (2015).
- 24) Belardini, A., Benedetti, A., Centini, M., **Leahu, G.**, Mura, F., Sennato, S., Sibilia, C., Robbiano, V., Giordano, M. C., Martella, C., Comoretto, D. and de Mongeot, F. B. (2014), Second Harmonic Generation Circular Dichroism from Self-Ordered Hybrid Plasmonic-Photonic Nanosurfaces. *Advanced Optical Materials*, 2: 208-213. doi: 10.1002/adom.201300385.
 - 25) **G. Leahu**, R. Li Voti, C. Sibilia, M. Bertolotti, "Anomalous optical switching and thermal hysteresis during semiconductor-metal phase transition of VO₂ films on Si substrate", *Applied Physics Letters*, 103 (23), 231114 (2013).
 - 26) Alessandro Belardini, **Grigore Leahu**, Maria Cristina Larciprete, Marco Centini, Concita Sibilia, C. Martella, M. Giordano, D. Chiappe, Francesco Buatier de Mongeot, "Anomalous refraction of self-assembled gold nanowires studied by the generalized Snell's law", *Photonics Letters of Poland* 5, 45-47 (2013)
 - 27) **G. Leahu**, R. Li Voti, S. Paoloni, C. Sibilia, and M. Bertolotti, Trace gas analysis from glazes by means of a compact photothermal deflection spectroscopy apparatus, *Rev. Sci. Instrum.* 84, 123111 (2013)
 - 28) A. Belardini, F. Pannone, **G. Leahu**, M. C. Larciprete, M. Centini, C. Sibilia, C. Martella, M. Giordano, D. Chiappe, and F. Buatier de Mongeot, "Evidence of anomalous refraction of self-assembled curved gold nanowires", *Appl. Phys. Lett.* 100, 251109 (2012).
 - 29) A. Belardini, F. Pannone, **G. Leahu**, M.C. Larciprete, M. Centini, C. Sibilia, C. Martella, M. Giordano, D. Chiappe, F. Buatier de Mongeot, *J. Europ. Opt. Soc. Rap. Public.* 7, 12051 (2012).
 - 30) Roberto Li Voti, Maria Cristina Larciprete, **Grigore Leahu**, Concita Sibilia, Mario Bertolotti, Optical response of multilayer thermochromic VO₂ based structures7 *JOURNAL OF NANOPHOTONICS* 6; 061601-1- 061601-5, (2012).(ISSN:1934-2608),
 - 31) R. Li Voti, M.C. Larciprete, **G.L. Leahu**, C. Sibilia, M. Bertolotti. "Optimization of thermochromic VO₂ based structures with tunable thermal emissivity" *JOURNAL OF APPLIED PHYSICS* 112, (3), 034305-1- 034305-5 (2012), (ISSN:1089-7550).
 - 32) M. C. Larciprete, A. Albertoni, A. Belardini, **G. Leahu**, R. Li Voti, F. Mura, C. Sibilia, I. Nefedov, I. V. Anoshkin, E. I. Kauppinen, A. G. Nasibulin, "Infrared properties of randomly oriented silver nanowires", *JOURNAL OF APPLIED PHYSICS* 112 (8), 083503-1, (2012),(ISSN: 0021-8979),
 - 33) R. Li Voti, **G.L. Leahu**, S. Gaetani, C. Sibilia, V. Violante, E. Castagna, M. Bertolotti "Light scattering from a rough metal surface: theory and experiment" 26, *J. Opt. Soc. Am. B* 1585-1593 (2009) (ISSN:0740-3224), UGOV ID:230611
 - 34) M. C. Larciprete, R. Ostuni, A. Belardini, M. Alonzo, **G. Leahu**, E. Fazio, C. Sibilia, M. Bertolotti, "Nonlinear optical absorption of zinc-phthalocyanines in polymeric matrix", *Photonics and Nanostructures – Fundamentals and Applications* 5, 73 (2007).
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 - 37) A. Belardini, A. Bosco, **G. Leahu**, M. Centini, E. Fazio, C. Sibilia, M. Bertolotti, S. Zhukovsky, S.V. Gaponenko, '*Femtosecond Pulses Chirping Compensation by Using 1-D Compact Multiple Defect Photonic Crystals*', *Appl. Phys. Lett.* **89**, 031111 (2006).
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 - 39) **G. Liakou**, S. Paoloni and M. Bertolotti, Observations of laser cooling by resonant energy transfer in Co₂-N₂ mixtures, *J. Appl. Phys.* 96, 4219 (2004).
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Optoelectronics and Advanced Materials 3 p.779-816 (2001).

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G.Leahu