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Georges Boulon

Emeritus Professor

Invitations to schools and associated articles

1. Invitations to INTERNATIONAL SCHOOL OF ATOMIC AND MOLECULAR SPECTROSCOPY, Ettore Majorana Foundation and centre for Scientific culture, Erice, Sicily, Italy

2. References of chapters in books of the Ettore Majorana Foundation

3. Invitations to other Schools and articles

1. Invitations to INTERNATIONAL SCHOOLS OF ATOMIC AND MOLECULAR SPECTROSCOPY, Ettore Majorana Foundation and centre for Scientific culture, Erice, Sicily, Italy



Ettore Majorana Foundation and Centre for Scientific Culture - International School of Atomic and Molecular Spectroscopy

Director: Prof. Baldassare Di Bartolo, Boston College

The purpose of the International School of Atomic and Molecular Spectroscopy is two-fold:

1. To bring the workers in spectroscopy and related disciplines up to date on the new experimental and theoretical developments in this field of research, and
2. To create an opportunity for the researchers in the various sub-fields of spectroscopy to discuss their problems in an interdisciplinary framework.

Spectroscopic investigations are concerned with phenomena observed when the radiation from a source, separated into its various wavelengths, is made to interact with the constituents of a physical system. Through the examination of particular spectra, the identification of known molecular species can be carried out; by means

of spectroscopy it has been possible, for example, to identify the presence of chemical elements in distant stars.

More basic applications of the science of spectroscopy have produced a better understanding of atomic and molecular structures and of such phenomena as luminescence. Rotational, vibrational and electronic states of molecules continue to be subjects of investigation; also the important field of energy transfer between the different degrees of freedom in molecules is an object of study.

In solids, spectroscopic investigations are directed to uncover the interrelation of absorption and emission properties with the location of the constituents and the crystalline symmetry. Studies of impurity spectra have shown the usefulness of spectral data in providing information about the spectra of such collective excitations of solids as phonons and magnons. Also, on the basis of purely spectroscopic data it is possible to predict the feasibility and efficiency of solid state systems as possible laser materials.

2019. LIGHT-MATTER INTERACTIONS TOWARDS THE NANOSCALE

2018. Workshop on New Developments in Advanced Luminescent Materials

2017. QUANTUM NANO-PHOTONICS

2016. Workshop on Advances in Luminescence Research

2015. NANO-OPTICS: PRINCIPLES ENABLING BASIC RESEARCH AND APPLICATIONS

2014. WORKSHOP ON COMPLEX LUMINESCENCE PHENOMENA IN INORGANIC MATERIALS

2013- NANO-STRUCTURES FOR OPTICS AND PHOTONICS Optical Strategies for Enhancing Sensing, Imaging, Communication, and Energy Conversion

2012-Workshop ON NEW DEVELOPMENTS IN INORGANIC LUMINESCENT MATERIALS

2011- NANO-OPTICS FOR ENHANCING LIGHT-MATTER INTERACTIONS ON A MOLECULAR SCALE: Plasmonics, Photonic Crystals, Metamaterials and Sub-Wavelength Resolution

2010- Workshop on Luminescence of Inorganic materials and bioimaging

2009- BIO-PHOTONICS: Spectroscopy, Imaging, Sensing, and Manipulation

2008- Workshop on advances in luminescent spectroscopy

2007- Frontier development in optics and spectroscopy [[Final Report](#): 6.3 MB PDF]

2006- Workshop on Advances in the Study of Luminescence Materials [[Final Report](#): 2.4 MB PDF]

2005 - New Developments in Optics and Related Fields: Modern Techniques, Materials and Applications [[Final Report](#): 4.9 MB PDF]

2004 - Advances in Luminescence Research [[Final Report](#): 1.4 MB PDF]

2003 - Frontiers of Optical Spectroscopy [[Group Photo](#)] [[Final Report](#): 5.2 MB PDF]
The book, sponsored by NATO, has been published by [Kluwer Academic Publishers](#) .

2002 - Workshop on the Status and Prospects of Luminescence Research

2001- Spectroscopy of Systems with Spatially Confined Structures

2000 - Workshop on Advanced Topics in Luminescence Spectroscopy

1999 - Advances in Energy Transfer Processes

1998 - Workshop on Advances in Solid State Luminescence Spectroscopy

1997 - Ultrafast Dynamics of Quantum Systems: Physical Processes and Spectroscopic Techniques

1996 - Workshop on Luminescence Spectroscopy

1995 - Spectroscopy and Dynamics of Collective Excitations in Solids

1993 - Nonlinear Spectroscopy of Solids: Advances and Applications

1991 - Optical Properties of Excited States in Solids

1989 - Advances in Nonradiative Processes

1987 - Disordered Solids: Structures and Processes

1985 - Spectroscopy of Solid-State Laser-Type Materials

1983 – Energy transfer in condensed matter

3. [References of chapters in books of the Ettore Majorana Foundation](#)

[\(20 chapters\)](#)

1. [Research of efficient and fast scintillator garnet crystals. The role of Ce⁴⁺ in Ce³⁺, Mg²⁺-co-doped Gd₃Al₂Ga₃O₁₂ from spectroscopic and XANES characterizations.](#)

G. Boulon, Y. Guyot, M. Guzik, G. Dantelle, D. Testemale, S. Kurosawa, K. Kamada, A. Yoshikawa

in: LIGHT-MATTER INTERACTIONS TOWARDS THE NANOSCALE-A NATO ADVANCED STUDY INSTITUTE/ ed. by Baldassare Di Bartolo, John Collins. - Dordrecht : Springer (2020)- Erice, Sicily, Italy: July 20—August 4, 2019

2. Research on the Yb³⁺ ion activated cubic molybdates and molybdate-tungstates for optical transparent ceramics

Guzik M., Bieza M., Tomaszewicz E., Guyot Y., Boulon G.,

in: Nano-optics for enhancing light-matter interactions on a molecular scale : plasmonics, photonic materials and sub-wavelength resolution /

Erice, Sicily, Italy; July 4-19, 2017

ed. by Baldassare Di Bartolo, John Collins. - Dordrecht : Springer (2019)

3. Localization of Yb³⁺, Er³⁺ and Co²⁺ dopants in an optical glass ceramics of MgAl₂O₄ spinel nano-crystals embedded in SiO₂ glass

G. Boulon, Y. Guyot, G. Alombert-Goget, M. Guzik, T. Epicier, L. Chen, L. Hu, W. Chen
In Nano-structures for optics and photonics.

NANO-OPTICS: PRINCIPLES ENABLING BASIC RESEARCH AND APPLICATIONS

Erice, Sicily, Italy; July 4-19, 2015

B. Di Bartolo, J. Collins, L. Silvestri, editors, published in the NATO Science Series,

Springer NATO Science for Peace and security series-B: Physics and Biophysics (2017)

eBook ISBN 978-94-024-0850-8 DOI10.1007/978-94-024-0850-8

4. Nd³⁺, Eu³⁺ and Yb³⁺ ions as structural probes in the scheelite-type cadmium molybdates with vacancies

M. Guzik*, J. Legendziewicz, E. Tomaszewicz, Y. Guyot, G. Boulon

In Nano-structures for optics and photonics.

NANO-OPTICS: PRINCIPLES ENABLING BASIC RESEARCH AND APPLICATIONS

Erice, Sicily, Italy; July 4-19, 2015

B. Di Bartolo and J. Collins editors, published in the NATO Science Series,

Springer NATO Science for Peace and security series-B: Physics and Biophysics (2017)

eBook ISBN 978-94-024-0850-8 DOI10.1007/978-94-024-0850-8

5. An approach in the structural analysis of Yb³⁺-doped YAG nano-ceramics by conjugation of TEM-EDX and optical techniques

G. Boulon, Y. Guyot, M. Guzik, T. Epicier, P. Gluchowski, D. Hreniak, W. Streck

In Optical Strategies for Enhancing Sensing, Imaging, Communication, and Energy Conversion

Erice, Sicily, Italy; July 4-19, 2013

B. Di Bartolo and J. Collins editors, published in the NATO Science Series,

Springer Series B Physics and Biophysics, (2014) 285-307

6. Is there segregation of rare earth ions in garnet optical ceramics?

G. Boulon, T. Epicier, W. Zhao, M. Guzik, Y. Pan, B. Jiang

In NANO-OPTICS FOR ENHANCING LIGHT-MATTER INTERACTIONS ON A MOLECULAR SCALE,

Erice, Sicily, Italy; July 4-19, 2011

B. Di Bartolo and J. Collins editors, published in the NATO Science Series,

Springer Series B Physics and Biophysics, (2013) 333-345

7. BIO-PHOTONICS: Spectroscopy, Imaging, Sensing, and Manipulation.

Erice, Sicily, Italy; July 2-17, 2009

Article not submitted for health reason

8. CO-OPERATIVE PROCESSES IN Yb³⁺-DOPED MATERIALS

G.Boulon

Frontier development in optics and spectroscopy, June 2007

B. Di Bartolo and O.Forte editors. Springer (2008)

9. Yb³⁺-doped CaF₂ fluoride as an example of our research approach in solid-state laser- type crystals

G.Boulon

In Advances in Spectroscopy for Lasers and Sensing, June 2005

B. Di Bartolo and O.Forte editors; Springer (2006) vol.231, 83-102

10. Combinatorial chemistry to grow single crystals and analysis of concentration quenching processes: Application to Yb³⁺-doped laser crystals

G. Boulon, C. Goutaudier, Y. Guyot, K.Lebbou, M.Ito, L.Laversenne

In Frontiers of Optical Spectroscopy, June 2003

B. Di Bartolo and O. Forte editors, published in the NATO Science Series, Kluwer Academic Publishers, Dordrecht, Boston, London (2005) vol.168, 689-714

11. Structures and Models of glasses-Recent Developments and Perspectives.

G.Boulon

In Spectroscopy of Systems with Spatially Confined Structures, July 2001

B. Di Bartolo editor,, published in the NATO Science Series, Kluwer Academic Publishers, Dordrecht, Boston, London (2002) vol.90, 515-558

12. Four-Wave Mixing Studies of Energy Transfer Processes

G.Boulon

Advances in Energy Transfer Processes, June 1999

B. Di Bartolo and X. Chen Editors, World Scientific, New Jersey, London, Singapore, Hong Kong, (2001), 411-430

13. Laser crystals emitting from UV to IR and the impact of nonlinear optics

G.Boulon

In Ultrafast Dynamics of Quantum Systems: Physical Processes and Spectroscopic Techniques, June 1997

B. Di Bartolo editor, published in the NATO Advanced Studies Series, Plenum Press, New York 1998. Plenum Press B 372 (1998) 583-609

14. Broad band centers applied for laser materials: Example of tetrahedrally coordinated centers.

G.Boulon

In Spectroscopy and Dynamics of Collective Excitations in Solids, June 1995

B. Di Bartolo editor, published in the NATO Advanced Studies Series, Plenum Press, New York (1997) vol.372, 561-573

15. Energy transfer mechanisms and excited state dynamics of Yb, Tm and Ho doped GGG single crystals

G.Boulon

In Nonlinear Spectroscopy of Solids: Advances and Applications, June 1993

B. Di Bartolo editor, published in the NATO Advanced Studies Series, Plenum Press, New York (1994) vol.339, 481-490

16. Excited-state dynamics and energy transfers in doped-substituted garnets

G.Boulon

Optical Properties of Excited States in Solids, June 1991

B. Di Bartolo editor, published in the NATO Advanced Studies Series, Plenum Press, New York (1992) vol.301, 445-478

17. Laser spectroscopy techniques applied to chromium (3+)-doped materials

Nie, W.; Monteil, A.; Boulon, G.

Advances in Nonradiative Processes in Solids, June 1989

B. Di Bartolo, editor, published in the NATO Advanced Study Institute Series B: Physics (1991), 249(Adv. Nonradiative Processes Solids), 425-441, Plenum Press, New York (1990)

18. Effects of disorder on the spectral properties of Cr-doped glasses, glass-ceramics and crystals

G.Boulon

In Disordered Solids: Structures and Processes, June 1987

B. Di Bartolo, editor, Ettore Majorana International Science Series: Physical Sciences (1989), 46(Disord. Solids: Struct. Processes), 317-41

19. Spectroscopy of post-transition metal ion

G. Boulon

In Spectroscopy of Solid-State Laser-Type Materials, June 1985

B. Di Bartolo, editor, Ettore Majorana International Science Series: Physical Sciences (1987), 30 (Spectrosc. Solid-State Laser-Type Mater.) 223-266

20. Spectroscopic studies of energy transfer in solids

G. Boulon

Energy Transfer Processes in Condensed Matter, June 1983

B. Di Bartolo, editor, NATO ASI Series, Series B: Physics (1984), 114

(Energy Transfer Processes Condens. Matter), 603-20

4. **Invitations to other Schools and associated articles**

-Redon (Bretagne)-Galerie 21-25 septembre 1981

Ecole d'été de Chimie du Solide du CNRS (J.Livage)

Spectroscopie laser des verres fluorescents

-Lyon (INSA)

Cours de formation sur les applications du laser de forte énergie au traitement des matériaux organisé par le CAST et le centre Laser CALFETMAT de l'INSA (B.Vannes) 12-16 septembre 1983 puis sept 1984, sept 1985, sept 1986, sept 1989 et sept 1990.

La Physique du laser

-Lyon (Villette d'Anton) 30 septembre-4 octobre 1985

Ecole d'été de chimie du Solide du CNRS organisée par le LPCML)

Principe de base des lasers à solide

-Ksiaz Castle, Poland-19-25 June 1988. First International School on excited states of transition elements (Prof.J.Legendziewicz, B.Jekowska-Trzebiatowska, W.Strek)

*The spectroscopic properties of Cr³⁺ and rare earth Nd³⁺ ions in new gadolinium gallium garnet laser crystals

World Scientific-Singapore.New Jersey London Hong Hong (1989) 96-120

*Selective one and stepwise two-photon excitations of Nd³⁺ UV and visible fluorescence in YAG:Nd and YAP:Nd.

World Scientific-Singapore.New Jersey London Hong Hong (1989) 325-330

-Grenoble (Lumbin) 19-23 septembre 1988

Société Française de Physique (G.Chartier, F.Stoeckel, Y.Merle d'Aubigné)

Les lasers trente ans déjà !

L'optique des résonateurs lasers :conditions d'auto-oscillation

-Sireul (Dordogne) mai 1991, B.Vannes, INSA de Lyon, GDR CNRS 911

Ecole de printemps Laser de puissance et traitement des matériaux

Les sources lasers de puissance de l'avenir

Laser de puissance et traitements des matériaux (Ed. B.Vannes) (CNRS et EPFL Lausanne)

Presses polytechniques et universitaires romandes, 153-174

-Luarca (Asturias-Espagne)

Ecole d'été "lasers sintonizable de estado solido y aplicaciones" (Prof. J. Fernandez)- 9-13 septembre 1991

Técnicas e espectroscopia de alta resolucion

-Karpacz (Poland) 2-6 September 1991

Second international school on excited states of transition elements (Prof;Strek, Ryba-Romanowski, J.Legendziewicz)

Spectroscopic properties of Ca-substituted garnets doped with V⁴⁺ and Mn⁴⁺

A.Suchocki, A.Brenier, C.Pedrini, C.Madej, G.Boulon

World Scientific-Singapore.New Jersey London Hong Hong (1992) 264-274

Presence of Cr³⁺ multisites and energy transfers between Cr³⁺ and rare earth ions in substituted garnets

A.Brenier, G.Boulon, C.pedrini, C.Madej

World Scientific-Singapore.New Jersey London Hong Hong (1992) 29-48

-Karpacz (Poland) 20-26 March 1992

1st Winter School on spectroscopy and structure of rare earth systems (Prof Strek)

Energy transfer mechanisms and excited state dynamics of Yb, Tm and Ho-doped GGG crystals

-Tilton School (USA) 28 juin-3 juillet 1992, M.Weber (Lawrence Livermore National Laboratory)

The Gordon conference: Optical properties of Glasses

Laser spectroscopy and scattering in glasses

-Ecole d'été de Cargèse, SFO (C.Fabre, J.C.Pocholle, P.Chavel, J.C.Saget) 20 juin-2 juillet 1994: Les lasers et leurs applications scientifiques et médicales

Matériaux pour lasers à solide,

Les éditions de physique SFO, 4, (1996) 259-285

-Kudowa (Poland) 30 août-5 septembre 1994

International School on excited states of transition elements

(Prof. Strek, Ryba-Romanowski, J.Legendziewicz)

Cr⁴⁺ and Mn⁵⁺ active centers for new solid-state laser materials

-Polanica Zdroj (Poland) 24-29 march 1996

2nd International Winter School.:Spectroscopy and structure of rare earth systems

(Prof.Hanuza)

Growth by LHPG, structure and spectroscopy of Nd³⁺-doped BNN single crystal fibers

-Duszniki Zdroj (Poland) 30 August-3 September 1997

Summer International School: Excited states of transition elements

(Prof. Strek)

Nonlinear single crystal fibers of undoped and Nd³⁺-doped niobates grown by LHPG, spectroscopy and SHG

-Szklaska Poreba (Poland) 26 April-1st May 1999

3rd International Winter School: spectroscopy and structure of rare earth systems

(Prof. Strek)

Yb³⁺-Er³⁺-co-doped LaLiP₄O₁₂ glass:a new eye-safe laser at 1535nm

-Zhao (Sendai), Japan, March and August 2002

International Forum and International School on Science and Technology of Crystal Growth. Prof.Fukuda

New Combinatorial Approach of Optical Properties From Fiber Single Crystals Grown by the LHPG Technique

- Patras (Greece), September 2002- Third GR-I International conference on New Laser Technologies and Applications,

- G. Boulon, L. Laversenne, C. Goutaudier, Y. Guyot and M.T. Cohen-Adad
Concentration dependence of radiative and nonradiative energy transfers in rare-earth-doped laser crystals grown from a new method based on gradient concentration fiber single crystal
Third GR-I International conference on New Laser Technologies and Applications, Patras (Greece), Sept.2002.
Proceedings of SPIE Int. Soc. Opt. Eng. Vol.5131 (2003) 108-120

- G. Boulon, G. Métrat, N. Muhlstein, A. Brenier, L. Kravchik, Y. Kalisky
Efficient diode-pumped Nd:KGd(WO₄)₂ laser grown by top nucleated floating crystal method
Third GR-I International conference on New Laser Technologies and Applications, Patras (Greece), Sept.2002
Proceedings of SPIE Int. Soc. Opt. Eng. Vol.5131, (2003) 121

- 4th Int. Spring School on Spectroscopy structure & synthesis of Rare Earth Systems (RES03), Ladek Zdroj Poland, June 2003
Analysis of quenching mechanisms in Yb³⁺-doped laser materials

-Ecole doctorale de l'Université de Tarragone (Espagne). 9-16 juillet 2004
Prof.F. Diaz University Rovira i Virgili (URV)-FiCMA (Physics and Crystallography of Materials)
Cours Master2 (20h sur l'ensemble des recherches actuelles des matériaux luminescents)

-2nd INTERNATIONAL CONFERENCE ON PHYSICS OF LASER CRYSTALS

ICPLC 2005 Yalta, Ukraine September 25-30 2005

-Kharkiv National University for Radioelectronics, pr.Lenin, 14, 61166 Kharkiv and Claude Bernard Lyon 1 University and Laser Materials Group of UMR 5620 CNRS, France

Yb³⁺-Doped Laser Crystals: Optical Characterizations and Concentration Optimization From the Growth of Crystalline Fibres

-Workshop of the « L'Ecole Doctorale Matériaux de Lyon (J.M.Pelletier) » Ecole centrale de Lyon, November 30, 2006
From laser single crystals to laser ceramics

-Radiation Processes in Nano and Bulk Materials, September, 17– 21 2007
ICPLC - RPNBM 07 *Sevastopol Crimea Ukraine*

-Kharkiv National University for Radioelectronics, Ukraine, and Claude Bernard Lyon 1 University and Laser Materials Group of UMR 5620 CNRS, France, in cooperation with Institute of Low Temperature and Structure Research PAS, Poland
Yb³⁺-doped CaF₂ crystals: sites structure and optimization of IR laser properties

-6th International Conference on Excited States of Transitions Elements
Hotel Polanica Resort & Spa, Polanica-Zdrój, Poland
21 - 26 August 2016