



# **THE 9th INTERNATIONAL CONFERENCE ON ADVANCED MATERIALS, ROCAM 2017**

&

## **THE 2nd INTERNATIONAL SYMPOSIUM ON DIELECTRIC MATERIALS AND APPLICATIONS, ISyDMA 2017**

**11-14 JULY 2017, BUCHAREST, ROMANIA**

Held under the auspices of  
**ACADEMY OF ROMANIAN SCIENTISTS**

An International Conference on Advanced Materials with Special  
Topics on Nano, Multifunctional and Photovoltaic Materials

# **ABSTRACT BOOK**

**EDITURA GRANADA  
2017**



# **THE 9th INTERNATIONAL CONFERENCE ON ADVANCED MATERIALS, ROCAM 2017**

&

**THE 2nd INTERNATIONAL SYMPOSIUM ON  
DIELECTRIC MATERIALS AND APPLICATIONS, ISyDMA 2017**

**11-14 JULY 2017,  
BUCHAREST, ROMANIA**

Held under the auspices of  
**ACADEMY OF ROMANIAN SCIENTISTS**

An International Conference on Advanced Materials with Special  
Topics on Nano, Multifunctional and Photovoltaic Materials

**ABSTRACT BOOK**

**EDITURA GRANADA, 2017**

## ROCAM 2017 ORGANIZERS:

ROMANIAN MATERIALS SCIENCE - CRYSTAL GROWTH SOCIETY  
UNIVERSITY OF BUCHAREST, FACULTY OF PHYSICS, ROMANIA  
NATIONAL INSTITUTE OF MATERIALS PHYSICS (NIMP), ROMANIA  
NATIONAL INSTITUTE FOR LASER, PLASMA & RADIATION PHYSICS, ROMANIA  
"CULTURE AND PHYSICS AT MAGURELE" FOUNDATION, ROMANIA

## ISyDMA 2017 ORGANIZERS:

MOROCCAN ASSOCIATION OF ADVANCED MATERIALS (A2MA)  
MOROCCAN ASSOCIATION OF APPLIED PHYSICS (MAPP)

## Abstract Book Editors:

Florin STANCULESCU  
Claudia NASTASE  
Florin NASTASE

**ISSN 1842-3574**

## SPONSORS

CULTURE AND PHYSICS AT MAGURELE"  
FOUNDATION



"CULTURE ANF PHYSICS AT MAGURELE" FOUNDATION  
Măgurele, Atomistilor street no. 105bis, Ilfov county, 07715, ROMANIA  
CIF 27256338  
Phone:021/369.01.85, fax 021/369.01.77, e-mail: pintilie@infim.ro

ROMANIAN MATERIALS SCIENCE - CRYSTAL  
GROWTH SOCIETY



MOLECULAR SYSTEMS DESIGN &  
ENGINEERING



SCHAEFER-TEC



## **ORGANIZING COMMITTEE**

- Chairmen: Horia Alexandru, University of Bucharest, Romania  
Joseph Greene, University of Illinois, Urbana, Illinois, USA  
Thomas Kuech, Univ of Wisconsin – Madison, USA  
Stefan Antohe, University of Bucharest, Romania  
Lucian Pintilie, NIMP, Bucharest – Magurele, Romania
- Program Chair: Florin Stanculescu, University of Bucharest, Romania
- Treasurer: Marcela Socol, NIMP, Bucharest, Romania
- Secretary: Anca Dumitru, University of Bucharest, Romania
- Members: Daniela Dragoman, University of Bucharest, Romania  
Ionut Marius Enculescu, NIMP, Bucharest - Magurele, Romania  
Lucian Gheorghe, INFLPR, Bucharest - Magurele, Romania  
Sorina Iftimie, University of Bucharest, Romania  
Florin Nastase, IMT-Bucharest, Romania  
Liviu Nedelcu, NIMP, Bucharest - Magurele, Romania
- Technical Committee: Stefania Mazilu, "Carol I" Central University Library, Bucharest, Romania  
Claudia Nastase, IMT-Bucharest, Romania  
Adrian Radu, University of Bucharest, Romania  
Silviu Vulpe, IMT-Bucharest, Romania  
Catalin Manu, NIMP, Bucharest - Magurele, Romania  
Carmen Breazu, NIMP, Bucharest - Magurele, Romania  
Oana Fufa, INFLPR, Bucharest - Magurele, Romania

## ROCAM 2017 INTERNATIONAL ADVISORY COMMITTEE

Philipp Adelhelm	University of Jena, Germany
Narcis Avarvari	Université d'Angers, FRANCE
Pierre Blondy	XLIM Université de Limoges CNRS, France
Dan Brett	University College London, UK
Lucia Curri	Institute for Physical and Chemical Processes, CNR, Bari Division, Italy
Hanna Dabkowska	McMaster University, Hamilton, Canada; Executive Comm. of International Organization for Crystal Growth
Mihaela Girtan	LPHIA: Laboratoire de Photonique d'Angers, Université d'Angers, France
Juozas Vidas Grazulevicius	Kaunas University of Technology, Lithuania
Catalin-Daniel Goldner- Constantinescu	Université de Limoges, France
Joseph Greene	University of Illinois at Urbana-Champaign, USA, Editor-in-Chief: Thin Solid Films
Maryline Guilloux-Viry	Institute des Sciences Chimiques de Rennes, Université de Rennes 1, France
Manuel Ricardo Ibarra García	Institute of Nanoscience of Aragon, University of Zaragoza
Jorge Iniguez	Luxembourg Institute of Science and Technology
Koichi Kakimoto	Research Institute for Applied Mechanics, Kyushu University, JAPAN, President: "International Organization for Crystal Growth"
Thomas Kuech	University of Wisconsin – Madison, USA, Ed-in-Chief J.Crystal Growth.
Victor Kuncser	NIMP, Romania
Roger M. LeBlanc	Department of Chemistry, University of Miami, USA
Andrei Manolescu	University of Reykjavik, Iceland
Hiroaki Minamide	Tera-Photonics Research Team, RIKEN Center for Adv. Photonics, Sendai, Japan
Mircea Modreanu	Tyndall National Institute, University College Cork, Ireland
Tadao Nagatsuma	Osaka University, Graduate School of Engineering Science, Toyonaka, Japan
Kazuo Nakajima	Institute for Materials Research, Tohoku University, Sendai, Japan
Nathan Newman	Arizona State University, USA
Cornelia Palivan	Department of Chemistry, University of Basel, Switzerland
Ion-Lucian Prejbeanu	Res Assoc CNRS, Spintronics and Technology of Components Lab. France
Jean Roncali	University of Angers, France
Florencio Sanchez	Inst. Ciència de Materials de Barcelona Campus UAB, Bellaterra, Catalonia, Spain
Paul Shearing	University College London, UK
Marius Stan	Argonne National Laboratory and Department of Energy Office of Nuclear Energy (DOE-NE). Member of the Editorial Boards of the Journal of Nuclear Materials, Journal of Phase Diagrams
Mihaela Stefan	University of Texas at Dallas, USA
Masahiko Tani	Univ of Fukui. Research Center for dev. Far-Infrared region.. Japan
Ion Tiginyanu	Academy of Sciences of Moldova and Technical University of Moldova, Republic of Moldova

Magdalena Titirici	School of Eng.and Mater. Science Queen Mary University of London Associate editor for J. Mater. Chem. A. Editorial board member of ChemSusChem (Wiley) and J. Mater. Chem. A (RSC)
Peter Vekilov	University of Houston, USA
Elias Vlieg	Radboud University Nijmegen, The Netherlands
Ionela Vrejoiu	University of Cologne, Physics Institute II, Germany
Robin Jeremy White	Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, BW, Germany
Xixiang Zhang	King Abdullah University of Science and Technology (KAUST), Saudi Arabia

## **ISyDMA 2017 INTERNATIONAL ADVISORY COMMITTEE**

ACHOUR Mohammed	Faculty of Sciences, University Ibn Tofail, Kenitra, Morocco
Essaid	
BROSSEAU Christian	Université de Bretagne Occidentale, France
BUKA Agnes	Wigner Research Centre of the Hungarian Academy of Sciences, Budapest, Hungary
COSTA Luís Cadillon	University of Aveiro, Portugal
CURRI Maria Lucia	CNR-IPCF Bari Division, Italy
ÉBER Nándor	Wigner Research Centre of the Hungarian Academy of Sciences, Budapest, Hungary
FATTOUM Arbi	Institut Préparatoire aux Etudes d'Ingenieurs Gafsa, Tunisie
GOUDA Ousama	Faculty of Engineering, Cairo University, Egypt
INGROSSO Chiara	CNR-IPCF Bari Division, Italy
JOMNI Fathi	Faculté des Sciences de Bizerte, Université de Carthage, Tunisia
LAHJOMRI Fouad	National School of Applied Sciences, Tangier, Morocco
MABROUKI Mustapha	FST, Sultan Moulay Slimane University, Beni-Mellal, Morocco
MENENDEZ Jose Luis	CINN-CSIC, Asturias, Spain
MESSOUSSI Rochdi	Faculty of Science, University "Ibn Tofail" Kenitra, Morocco.
MOUSA Marwan	Dept. of Physics, Mu'tah University, Al-Karak, Jordan
Suleiman	
OUERIAGLI Amane	Faculty of Science Semlalia, Cadi Ayyad Univeristy , Marrakech, Morocco
PISSIS Polycarpus	National Technical University of Athens, Greece
PETKOV Plamen	Department of Physics, University of Chemical Technology and Metallurgy, Sofia, Bulgaria
PETKOVA Tamara	IEES, Bulgarian Academy of Sciences, Sofia, Bulgaria
RAHMOUN Khadidja	Sciences Faculty, Tlemcen University, Algeria
RAOUADI Khaled	LMOP, Tunis El Manar, Tunisia
STRICCOLI Marinella	CNR-IPCF Bari Division, Italy
TACHAFINE Amina	LEMCEL, Littoral-Côte d'Opale University, France
TEGUAR Madjid	Ecole Nationale Polytechnique, Alger, Algeria
TOUAHNI Rajaa	Faculty of Science, University "Ibn Tofail" Kenitra, Morocco
TRIKI Asma	Sciences Faculty, Sfax University, Tunisia

## **ROMANIAN SCIENTIFIC COMMITTEE**

Alexandru Aldea, National Institute of Materials Physics, Bucharest  
Horia V. Alexandru, Faculty of Physics, University of Bucharest  
Stefan Antohe, Faculty of Physics, University of Bucharest  
Mihaela. Baibarac, National Institute of Materials Physics, Bucharest  
Emil Barna, Faculty of Physics, University of Bucharest  
Daniel Bilc, INCDTIM, Cluj-Napoca  
Victor Ciupina, "Ovidius" University, Constanta  
Magdalena Ciurea, National Institute of Materials Physics, Bucharest  
Daniela Dragoman, Faculty of Physics, University of Bucharest  
Anca Dumitru Faculty of Physics, University of Bucharest  
Mihai Gartu, "Ovidius" University, Constanta  
Lucian Gheorghe, National Institute for Laser, Plasma and Radiation Physics, Bucharest  
Mihai A. Grumazescu, Politehnica University of Bucharest  
Felicia Iacomi, Faculty of Physics, Alexandru Ioan Cuza University of Iasi  
Lucian Ion, Faculty of Physics, University of Bucharest  
Wilhelm Kappel, ICPE - Adv. Res, Bucharest  
Daniel Munteanu, Transilvania University of Brasov  
Florin Nastase, IMT-Bucharest  
Margarit Pavelescu, Academy of Romanian Scientists, Bucharest  
Ioana Pintilie, National Institute of Materials Physics, Bucharest  
Lucian Pintilie, National Institute of Materials Physics, Bucharest  
Mihai Popescu, National Institute of Materials Physics, Bucharest  
Aurelian Rotaru, Stefan cel Mare University of Suceava  
R. Savastru, National Institute for Optoelectronics, Bucharest  
Florin Stanculescu, Faculty of Physics, University of Bucharest  
Cristian M. Teodorescu, National Institute of Materials Physics, Bucharest  
Florin Vasiliu, National Institute of Materials Physics, Bucharest  
Daniel Vizman, West University of Timisoara  
Valentin Vlad, President of Romanian Academy  
Marius Volmer, Transilvania University of Brasov  
Maria Zaharescu, Romanian Academy



## EXHIBITORS

---



**AGILROM SCIENTIFIC SRL**

---



**AMS 2000 Trading Impex SRL**

---



**Analytik Jena**

---



**Andreescu Labor & Soft SRL**

---



**HISTERESIS SRL**

---



**HYPO Tech & Consulting SRL**

---



**schaefer**

[www.schaefer-tec.com](http://www.schaefer-tec.com)

**Schaefer-Tec**

---

The logo for Molecular Systems Design & Engineering features the text "Molecular Systems Design & Engineering" in a white sans-serif font on a black background. A stylized, abstract graphic of a molecular structure is visible on the right side.

**Molecular Systems  
Design & Engineering**

**MOLECULAR SYSTEMS  
DESIGN & ENGINEERING**

---



## FOREWORD to ROCAM and ISyDMA 2017 Conference

The 9<sup>th</sup> International Conference on Advanced Materials, ROCAM 2017 and  
The 2<sup>nd</sup> International Symposium on Dielectric Materials and Applications, ISyDMA 2017  
will be held at RIN Grand Hotel, Bucharest, July 11-14, 2017.

The International Summer School on Crystal Growth and Advanced Materials for Energy Conversion will be jointly organized July 10-15 in the same place.

All events shall be organized under the auspices of ACADEMY OF ROMANIAN SCIENTISTS.

The main organizer is the ROMANIAN MATERIALS SCIENCE-CRYSTAL GROWTH SOCIETY, affiliated as National Association at INTERNATIONAL ORGANIZATION for CRYSTAL GROWTH.

Other important co-organizer institutions of ROCAM 2017 are:

University of Bucharest - Faculty of Physics,  
National Institute of Materials Physics (NIMP), Bucharest  
National Institute for Laser, Plasma & Radiation Physics  
Culture and Physics at "Magurele" Fondation, Romania  
and of the ISyDMA 2017 are:

Marocan Association of Advanced Materials (A2MA) and  
Marocan Association of Applied Physics (MAPP).

ROCAM 2017 Conference covers four days (July 11-14) including eight sections

- S1. Crystals: Growth, Characterization, Modeling and Applications**
- S2. Solar Energy. Advanced Materials and Devices**
- S3. Thin Films and Nanostructures of Advanced Functional Materials**
- S4. Advanced Materials for Energy and Environmental Applications**
- S5. Electronic Materials and Devices: from RF to THz**
- S6. Advanced Biomaterials, Biodevices and Biotechnology**
- S7. Advances in Dielectric, Ferroelectric, Multiferroic Materials**
- S8. Emerging Materials**

There are six plenary lectures delivered by the following distinguished personalities:

**Prof. Koichi KAKIMOTO**, Japan, **President of the International Organization for Crystal Growth**

**Prof. Thomas Kuech**, USA, **Vice-President of the International Organization for Crystal Growth**,  
Editor-in-Chief "J. Crystal Growth"

**Prof. Joseph Greene**, USA, Editor-in-Chief "Thin Solid Films"

**Prof. Peter Vekilov**, University of Houston, USA

**Prof. Elias Vlieg**, Radboud University, The Netherlands

**Prof. Tadao Nagatsuma**, Osaka University, Toyonaka, Japan

More than 270 participants from all over the world will attend the Conference. In the Abstract Book, almost 311 abstracts were included. There are 51 invited, 101 oral and 153 poster contributions.

The title of "Honorary Member of the Romanian Materials Science - Crystal Growth Society" and the diploma, will be awarded to some distinguished participants.

Full paper contributions presented in the conference will be published in the international journals:

*Thin Solids Films, J. Crystal Growth, Ferroelectrics, International Journal of Pharmaceutics, Journal of Optoelectronics and Advanced Materials, Optoelectronics and Advanced Materials-Rapid Communications.*

We are indebted to our colleagues from the University of Bucharest, Faculty of Physics and from the National Institute of Materials Physics (NIMP) Bucharest, members of the organizing team of the conference, who accomplished difficult technical, logistic and administrative tasks.

Bucharest, June 2017

Prof. Horia ALEXANDRU

University of Bucharest, Faculty of Physics,

Chairman of ROCAM 2017

E-mail: [hvalexandru@gmail.com](mailto:hvalexandru@gmail.com)



<b>P</b>	<b>Plenary Lectures</b>	<b>1</b>
<b>S1</b>	<b>Crystals: Growth, Characterization, Modeling and Applications</b>	<b>7</b>
	<i>Section Organizers</i>	
	Horia ALEXANDRU, University of Bucharest, Romania Lucian GHEORGHE, National Institute for Laser, Plasma and Radiation Physics, Romania	
<b>S2</b>	<b>Solar Energy. Advanced Materials and Devices</b>	<b>33</b>
	<i>Section Organizers</i>	
	Stefan ANTOHE, University of Bucharest, Romania Mihaela GIRTAN, PV-Thin Films, Photonics Laboratory, Angers University, France Ioana PINTILIE, National Institute of Materials Physics, Romania	
<b>S3</b>	<b>Thin films and nanostructures of advanced functional materials</b>	<b>51</b>
	<i>Section Organizers</i>	
	Lucian PINTILIE, National Institute of Materials Physics, Romania Felicia IACOMI, Faculty of Physics, Alexandru Ioan Cuza University of Iasi, Romania	
<b>S4</b>	<b>Advanced Materials for Energy and Environmental Applications</b>	<b>89</b>
	<i>Section Organizers</i>	
	Anca DUMITRU, University de Bucharest, Romania Maria-Magdalena TITIRICI, Queen Mary University of London, UK	
<b>S5</b>	<b>Electronic materials and devices: from RF to THz</b>	<b>117</b>
	<i>Section Organizers</i>	
	Liviu NEDELCU, National Institute of Material Physics, Romania Aurelian CRUNTEANU, X-LIM Institute, University of Limoges, France Masahiko TANI, University of Fukui, Japan	
<b>S6</b>	<b>Advanced Biomaterials, Biodevices and Biotechnology</b>	<b>133</b>
	<i>Section Organizers</i>	
	Florin NASTASE, National Institute for Research and Development in Microtechnologies, Romania Anca DUMITRU, University de Bucharest, Romania Mihai Alexandru GRUMEZESCU, University Politehnica of Bucharest, Romania	
<b>S7</b>	<b>Advances in dielectric, ferroelectric, multiferroic materials</b>	<b>155</b>
	<i>Section Organizers</i>	
	Lucian Pintilie, National Institute of Materials Physics, Romania Cristian-Mihail TEODORESCU, National Institute of Materials Physics, Romania Daniel BILC, INCDTIM Cluj-Napoca, Romania	
<b>S8</b>	<b>Emerging materials</b>	<b>173</b>
	<i>Section Organizers</i>	
	Daniela DRAGOMAN, University of Bucharest, Romania Florin STANCULESCU, University of Bucharest, Romania	



# Plenary Lectures