

IUVSTA WORKSHOP

Plasmonic Thin Films: Theory, Synthesis and Applications

VENUE: [CCVF- Cultural Centre Vila Flor](#), located in the city of Guimarães, Portugal

Welcome Reception: [Ducal Palace](#) (*Paço dos Duques*), Guimarães, Portugal

Co-Organized by the [Centre of Physics of the University of Minho](#) and [International Iberian Nanotechnology Laboratory](#).

Guimarães is a city with a glorious past history, whose history is associated with the founding of the Portuguese national identity and the Portuguese language in the 12th century. This is why it is known till today as the Cradle of Portugal or the Cradle city. Distinguished by its unique and exemplary restored heritage, the historic centre has been recognized by UNESCO in 2001 as World Heritage.

The appreciation of culture and sports events promoted the creation of a network of cultural and sports facilities, which put Guimarães in a prominent place in the arts and performances at national and international level, culminating in 2012 as European Capital of Culture and, in 2013, as European city of Sport. Moreover, the city's good environmental practices have led the city to join in 2018 the list of candidates for the award of European Green Capital 2020.

All these attributes and contributions make Guimarães an attractive city to live and, therefore, attractive to visit.



DATES of the WORKSHOP: 4 to 7 October 2021

Scientific Program

Introduction

Thin films manifesting (localized) surface plasmon resonances (SPR and LSPR) are widely used in different applications. The change in their use from bulk materials to thin films has prompted their application in several technological fields, ranging from biological labels, markers, stains for various microscopes, waveguides, switches, and, more recently, in various types of sensing devices.

The extensive research in thin films has been expanding, thanks to advancements in bottom-up fabrication methods and the use of different types of nanomaterials combinations. Depending on the type of application, there are several technologies that may be used to prepare a thin-film system, ranging from physical vapor deposition (PVD) techniques, to chemical vapor deposition (CVD) methods or atomic layer deposition (ALD), among others. Thin films are typically more sensitive to changes in a local environment than many bulk materials, which is widening their use and the research for different approaches and systems. Every single property of a thin film can be controlled/modified at the nanoscale by the deposition process, offering multiple advantages (e.g., high surface-to-volume ratios) over bulk counterparts.

This workshop will be focused on the latest advances and most exciting results in the area of plasmonic thin films, i.e. materials that manifest collective oscillations of free electrons, used to: enhance several light-matter interaction processes (Raman scattering, photocatalysis, chemical energy conversion, heat generation, photovoltaics, etc.); to accurately detect different kinds of molecules and biomolecules using label-free sensing platforms; or even to perform biological imaging and photothermal therapies.

In fact, in the last decade, there has been significant advances in both theoretical and experimental investigations of surface plasmons, which led to the development of new simulation methods to calculate the optical properties of nanoplasmonic systems and has delivered a relevant number of important applications.

The workshop will welcome contributions reporting new knowledge and/or breakthrough innovations in the development of plasmonic thin films, addressing radical new design concepts that can be supported by theory, and new thin film deposition pathways to fabricate these materials.

Principal Themes and Topics of the Workshop are (but not limited to):

1. Theory of Surface Plasmons:
 - 1.1. Surface Plasmon Polaritons (SPPs)
 - 1.2. Localized Surface Plasmons (LSPs)
 - 1.3. Fano Resonances
 - 1.4. Gap plasmons
2. Synthesis of Plasmonic Thin Films:
 - 2.1. Sputtering and other Physical Vapour Deposition (PVD) Techniques
 - 2.2. Chemical Vapour Deposition (CVD)
 - 2.3. Atomic Layer Deposition (ALD)
 - 2.4. Electron-beam lithography (EBL)
 - 2.5. Hybrid and other production techniques
3. Applications of plasmonic thin films:
 - 3.1. Surface plasmon resonance (SPR) biosensors and LSPR sensors;
 - 3.2. "Hot-Spots" for Surface-Enhanced Raman Scattering (SERS);
 - 3.3. Plasmon-enhanced Photocatalysis;
 - 3.4. Graphene – Metal Nanoparticles systems;

- 3.5. Transition Metal Dichalcogenides coupled to plasmonic structures (e.g. Fano Resonances);
- 3.6. Enhanced magneto-optical Kerr effect using plasmonic materials;
- 3.7. Other recent application or related domains

IUVSTA SPONSORING DIVISIONS: Thin Films Division

NAMES AND NATIONALITIES OF ORGANIZERS

Local Organizing/ Scientific Committee (Open Ended List)

[Joel Borges](#)^{*}, Researcher, [Centre of Physics](#) (IUVSTA TFD / Portugal)

[Filipe Vaz](#), Pro-Rector, Associate Professor with habilitation, [Centre of Physics](#), University of Minho

[Pedro Alpuim](#), Assistant Professor, Researcher at [International Iberian Nanotechnology Laboratory](#)

[Marco S. Rodrigues](#), Researcher, [Centre of Physics](#), University of Minho

Scientific Committee (Open Ended List)

[Jay H. Hendricks](#), NIST, Gaithersburg, United States (IUVSTA Scientific Director)

[Katsuyuki Fukutani](#), University of Tokyo, Tokyo, Japan (IUVSTA Scientific Secretary)

[Mile Ivanda](#), Institute Ruder Boskovic, Zagreb, Croatia (IUVSTA TFD Chair)

[Papken E. Hovsepian](#), Sheffield Hallam University, Sheffield, United Kingdom (IUVSTA TFD Vice-Chair)

[Diederik Depla](#), Universiteit Gent, Ghent, Belgium (IUVSTA TFD Secretary)

[Carlos Tavares](#), Assistant Professor, Centre of Physics, University of Minho ([SOPORVAC](#) – President of Portuguese Vacuum Society)

[Nicolas Martin](#), Université Bourgogne Franche-Comté, Besancon, France

*Joel Borges, joelborges@fisica.uminho.pt ; joelborges22@gmail.com

Researcher at the Centre of Physics of Minho and Porto Universities

Universidade do Minho

Escola de Ciências, Centro de Física

Campus de Azurém

4800-058 GUIMARÃES

PORTUGAL

NAMES AND NATIONALITIES OF LIKELY INVITED SPEAKERS (Open Ended List):

[Nuno Miguel R. Peres](#), Centre of Physics, University of Minho, Portugal

[Joaquín Fernández-Rossier](#), International Iberian Nanotechnology Laboratory, Portugal

[Alberto Palmero](#), CSIC-USE - Instituto de Ciencia de Materiales de Sevilla (ICMS), Sevilla, Spain

[David Babonneau](#), Université de Poitiers, Poitiers, France

[Jakub Dostálek](#), Austrian Institute of Technology, Vienna, Austria

[Duncan S. Sutherland](#), Aarhus Universitet, Aarhus, Denmark

[Adi Salomon](#), Bar Ilan's Institute for Nanotechnology and Advanced Materials, Ramat Gan, Israel

[Jennifer A. Dionne](#), Stanford University, Palo Alto, United States

[Mark I. Stockman](#), Georgia State University, Atlanta, United States

[Jianfang Wang](#), Chinese University of Hong Kong, Shatin, Hong Kong

NAMES OF OTHER SPONSORS /SPONSORSHIP

There will be a fee for Contributed Talks / Participants (500€ for regular fee)

Other sponsors (City Hall, Tourism, Local SMEs, etc.) to be considered

UNDERWRITING: University of Minho will insure any financial losses.

BUDGET

TITLE: Plasmonic Thin Films: Theory, Synthesis and Applications				
VENUE: Guimarães, Portugal				
DATE: 04/10/2012 to 07/10/2021				
Income	Unit cost (EUR)	Quantity	Sub-Total (EUR)	Remarks
Registration Fee (per person)	500	34	17 000	34 registered participants plus 10 invited speakers plus 6 Organizers
			0	
IUVSTA funding	6 000	1	6 000	Funding supports for invited speakers
Total (EUR)			23 000	
Expenditures	Unit cost (EUR)	Quantity	Sub-Total (EUR)	Remarks
Meals (4 days per person)	80	50	4 000	Lunch breaks and Coffee breaks
Excursion (per person)	20	50	1 000	Transportation and Tickets
Banquet (per person)	30	50	1 500	
Meeting Rooms (per day)	1 200	4	4 800	
Hotel Rooms (4 nights per invited speaker)	400	8	3 200	Two Invited Speakers are Local Researchers
Advertisement	500	1	500	
Temporary Labors (per person)			0	
Miscellaneous	3 000	1	3 000	Includes Prize for Best Presentation by Students
Airticket partial funding (Europe, per person)	400	5	2 000	Partial funding for 6 invited speakers on request
Airticket partial funding (EU/Asia Pacific, per person)	1 000	3	3 000	Partial funding for 4 invited speakers on request
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CHECKLIST FOR APPLICANTS

I AGREE to

PROVIDE full information of event to the IUVSTA Scientific Secretary

PROVIDE a budget, updated in the event of major changes, to the IUVSTA Scientific Secretary

PROVIDE a dedicated Website for the event:

Name and e-mail address of person who will maintain the site:

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Name and e-mail address of person who will provide this report:

Joel Borges, joelborges@fisica.uminho.pt ; joelborges22@gmail.com

AGREE to include IUVSTA name and logo on all event announcements
AGREE to use IUVSTA numbering system (e.g. IUVSTA Workshop no NN) on all event announcements

AGREE to give a short presentation on IUVSTA at the beginning of the event.

AGREE to distribute any IUVSTA material provided to the organizers

AGREE not to have a published Proceedings of the event

AGREE to follow the Workshop Guidelines described in the IUVSTA Procedure Manual

I agree to fulfil all the points of the above checklist

Name: Joel Borges

Date and Signature:

IUVSTA WORKSHOP

Plasmonic Thin Films: Theory, Synthesis and Applications

VENUE: CCVF- Cultural Centre Vila Flor, located in the city of Guimarães, Portugal

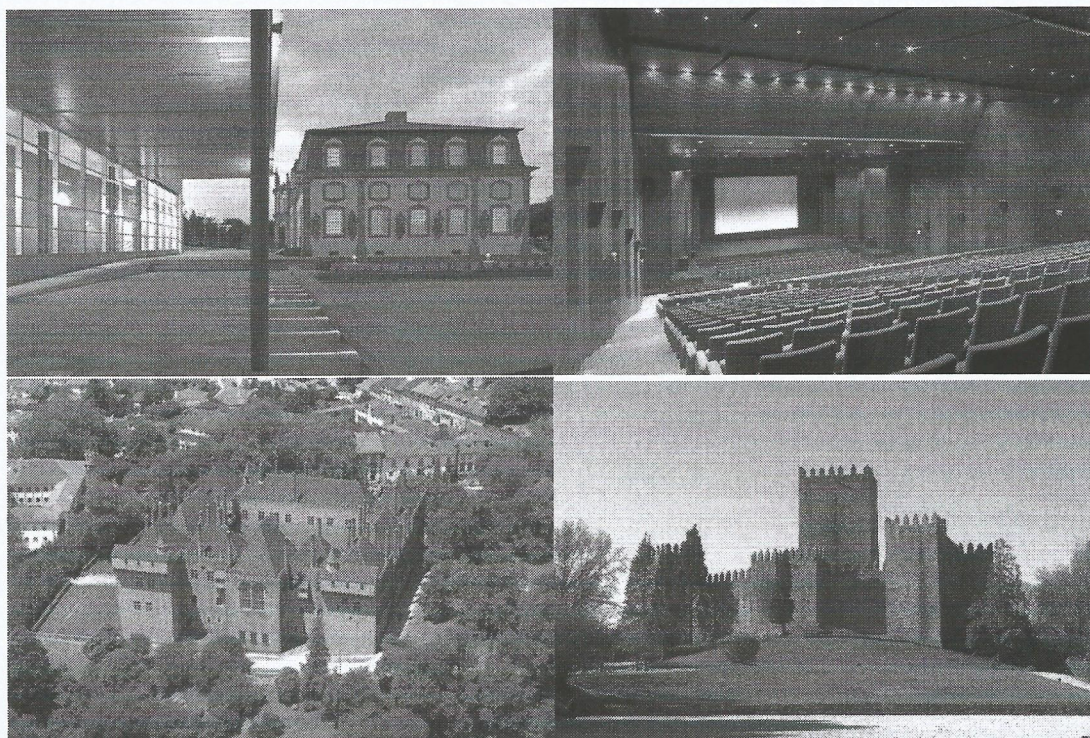
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Date and Signature:

17/02/2020

Joel Nuno Pinto Borges