



Fifth International Symposium on  
**ENERGY CHALLENGES  
AND MECHANICS**  
Working on Small Scales

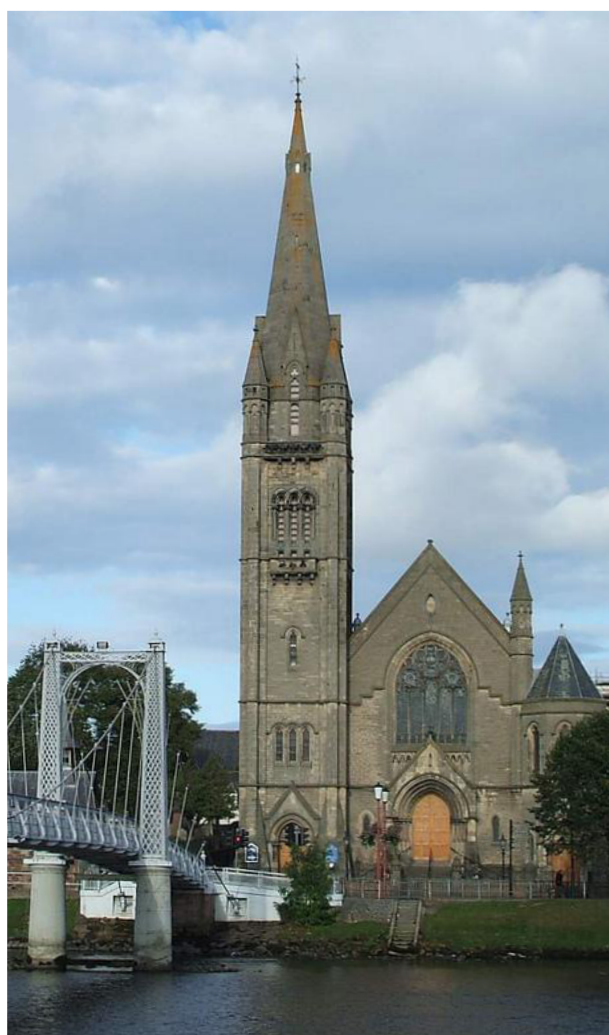
**Conference Guide**

Kingsmills Hotel, Culcabock Road  
Inverness IV2 3LP Scotland, UK

10 - 14 July 2016

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## A WELCOME LETTER

Distinguished Delegates,

Welcome to Inverness— the capital of the Scottish Highlands and the happiest place in Scotland according to recent surveys. In addition to your professional advancement over the course of our gathering, we hope you're able to fully experience the rich cultural and scenic offerings of this area.

This symposium explores the current state-of-art small scale technologies being applied to solve energy issues. This challenging work requires creative solutions and cross-disciplinary collaborations among you— the scientists, engineers and industry managers gathering from many nations around the world. This is the call that brings us all here today.

On behalf of the scientific committee and planning team we thank you for being here— your commitment and passion could not be more evident. We look forward to observing the relationships that form this week and wish you a most productive and enjoyable conference.

Welcome to ISECM 2016!



Best Regards,

Handwritten signature of Dr. Henry Tan.

Dr. Henry Tan  
Conference Chairman  
University of Aberdeen

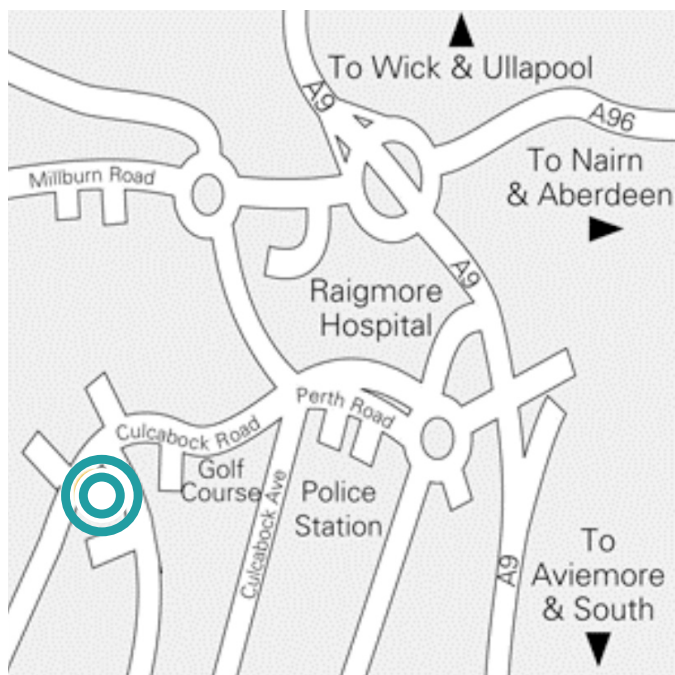
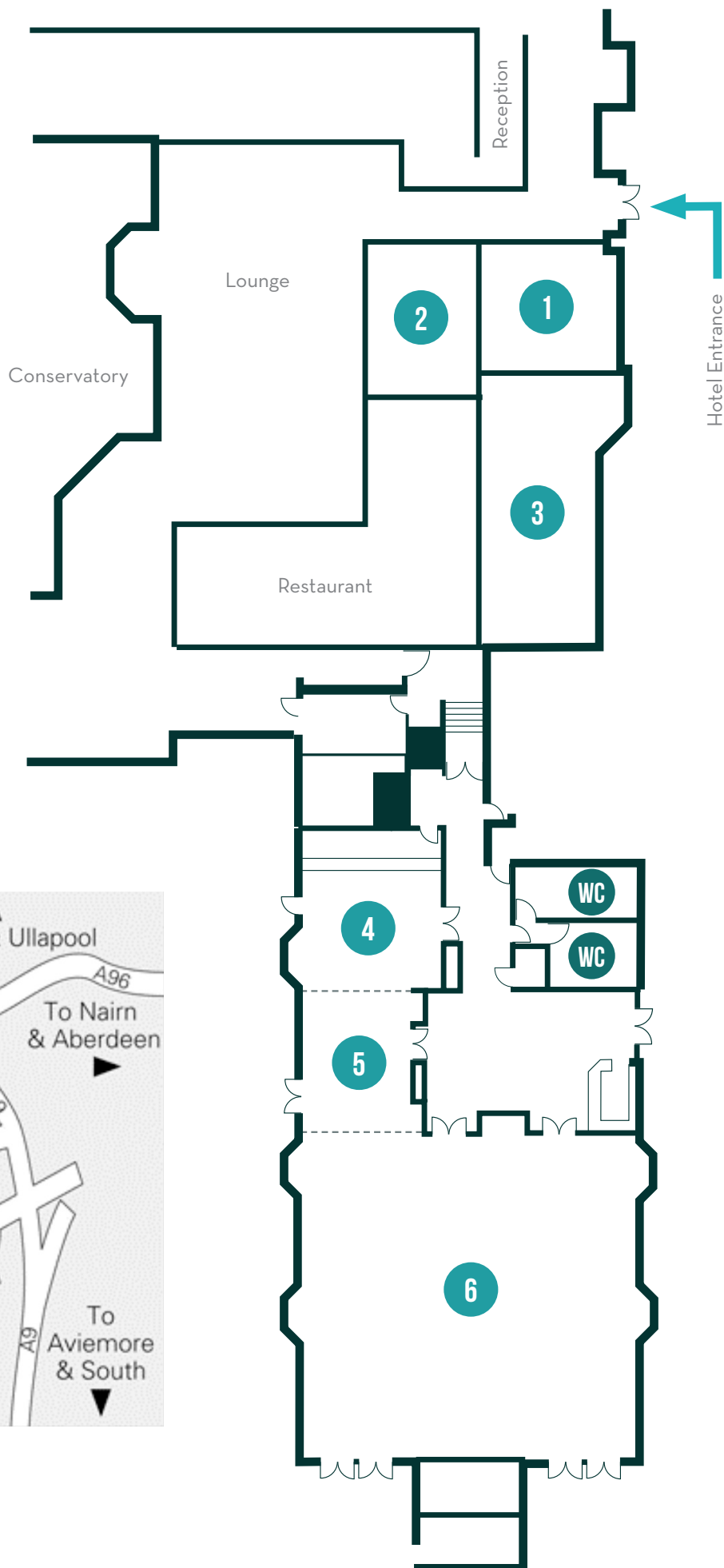
# CONFERENCE SCHEDULE

| DAY 1<br>Monday, 11 July 2016  | DAY 2<br>Tuesday, 12 July 2016   | DAY 3<br>Wednesday, 13 July 2016      | DAY 4<br>Thursday, 14 July 2016   |
|--|--|---------------------------------------|---|
| <b>REGISTRATION</b><br>8:00 – 9:00<br><i>Macleod Room</i>  | <b>PRINCIPAL LECTURE</b><br>8:30 – 9:10<br><i>Kingsmills Suite</i>             | <b>PARALLEL E</b><br>8:30-10:15       | <b>AWARDS BANQUET &amp; CLOSING LECTURE*</b><br>10:30 – 15:15<br><i>The New Drumossie Hotel</i>     |
| <b>OPENING REMARKS</b><br>9:00 – 9:25<br><b>OPENING LECTURE</b><br>9:40 – 10:20<br><i>Kingsmills Suite</i>                                       | <b>BREAK</b><br>9:10 – 9:30  | <b>BREAK</b><br>10:15-10:35           | 11:00 – 11:40<br><i>Closing Lecture</i>   |
| <b>BREAK</b><br>10:20 – 10:40  | <b>PARALLEL D</b><br>9:30-11:15  | <b>PARALLEL F</b><br>10:35 – 12:20    | 12:10 – 15:00<br><i>Awards Banquet<br/>Entertainment by<br/>Fiona Kennedy</i><br><br>Lunch included |
| <b>PARALLEL A</b><br>10:40 – 12:25   | <b>CATERED LUNCH</b><br>11:15 – 12:20  | <b>CATERED LUNCH</b><br>12:20 – 13:40 | 13:40<br><i>Closing Remarks</i>   |
| <b>CATERED LUNCH</b><br>12:25 – 13:40  | <b>CASTLE TRIP*</b><br>12:20 – 17:30<br><i>Included With Full Registration</i> | <b>PARALLEL G</b><br>13:40 – 15:25    | 14:15<br><i>Group Photo</i>   |
| <b>PARALLEL B</b><br>13:40-15:25   | 14:00<br><i>Falconry Show</i>  |                                       | <i>*Bus transportation to and from the Kingsmills Hotel will be provided.</i>                       |
| <b>BREAK</b><br>15:25-15:45  | 14:50<br><i>Castle tour and<br/>Wine Tasting by Dion</i>                       |                                       |   |
| <b>PARALLEL C</b><br>15:45 – 17:30   | 16:45<br><i>Departure Time</i>   |                                       |   |
| <b>WELCOME RECEPTION</b><br>17:30 – 19:30<br><i>Kingsmills Suite</i><br><br>18:00<br><i>Group Photo</i><br><br>18:30<br><i>Poster Exhibition</i> | <i>*Bus transportation to and from the Kingsmills Hotel will be provided.</i>  |                                       |   |



# VENUE MAP

1. MACLEOD ROOM
2. ADAMS ROOM
3. BURNS ROOM
4. CULCABOCK SUITE
5. DAMFIELD SUITE
6. KINGSMILLS SUITE



# IMPORTANT POINTS

## Getting Here

**Address:** Kingsmills Hotel  
Culcabock Road Inverness IV2 3LP  
**Tel:** 01224 313377

### Local Taxi Services:

01463 222555  
01463 222555  
01463 808080

## Conference Attire

All attendees are asked to wear business casual attire for the duration of the conference.

## Identification

All delegates must wear their lanyard name badge at all times. Your badge is your ticket and therefore gives you access to all sessions, lunch catering and the social programme.

Badges are strictly non-transferable. Please ensure you keep these safe. If you cannot provide a badge or identification to verify your booking then you may be asked to leave the event.

## Certificate Of Attendance

All delegates had the opportunity to request a certificate during the online booking process (see your registration packet). If you did not request a certificate during booking, an electronic version can be sent to you after the conference. Please notify the organisers at the Information Desk if you require an electronic certificate.

## Session Etiquette

**Speakers:** During the 20 minute break before your session slot, find your presentation room and upload your presentation files to the provided laptop. **Please ensure that you remain within your timeslot for your presentation and Q&A.** It is essential that the conference runs on time.

**Moderators:** Please arrive for your session at least 5 minutes in advance so you are prepared and ready to begin the session on time.

**Audience members:** Please note that the use of photography during presentations is strictly forbidden. **It is unethical to take photographs**

**without consent of a speaker** (you may be asked to delete images). Please respect the speakers and limit your photos to before/after the talks.

**Slide Copyright:** All slides presented at ISECM 2016 are the sole property of each speaker and cannot be copied or redistributed without permission.

## Presentation & Technology Tips

Each conference room is equipped with a laptop, projector, and clicker for controlling the PowerPoint presentations. Login information has been written on each laptop (this will allow you to access the guest account set up for this conference).

**(1) To access the Microsoft suite,** press the windows key (lower left on the keyboard). A start menu will appear where you can click the program you need.

Each laptop/projector will be pre-set to the “extend” display setting. This means the laptop will function as one screen and the projector will function as another. When you open a **PowerPoint presentation**, it will only appear on the laptop screen. **(2a) View the presentation in full screen mode in order to utilize both screens.** Choose full screen mode within the slideshow menu or by pressing the F5 key on the keyboard.

If you are using an **(2b) Adobe PDF presentation**, **move the whole PDF window onto the 2nd screen**, which is the projector. This is done by clicking and holding onto the title bar of the window and dragging it to the right until it appears onto the projector screen.

Please Note:

- » Our computers are not connected to the Internet and are unable to do so during presentations.
- » All presentations and data left on the Laptops after each day WILL be erased from the computer. However we strongly encourage all delegates to erase all data and material themselves.

## Photography Consent

There will be an official photographer during the conference. If you do not wish to have your photograph taken, please notify the organisers at the Information Table.

# OPENING PLENARY LECTURE



## Spin-Photonics For Energy Efficient Information Technologies

**Dr. Theo Rasing**

Institute for Molecules and Materials  
Radboud University, The Netherlands

Prof. Theo Rasing (1953) is full professor of physics at Radboud University, Nijmegen. After postdoctoral stays at UC Berkeley (IBM fellowship) he became staff scientist and deputy program leader at the Lawrence Berkeley Laboratory, where he developed nonlinear optical techniques for surface and interface studies. He has published over 430 papers that have been cited over 9000 times (h index 46, Web of Science).

Rasing is an elected member of the Royal Dutch Academy of Arts and Sciences (KNAW), elected member of the Academia Europaea, honorary member of the Ioffe Institute in St. Petersburg, Knight of the Order of the Dutch Lion and recipient of many scientific prizes and awards, including an ERC Advanced Grant 2013, the Spinoza Award 2008, the Prize for Science and Society 2008 and Distinguished Lecturer 2009, IEEE Magnetics Society.

# PRINCIPAL LECTURE



## Everything You Always Wanted To Know About Cold Fusion, But Were Afraid To Ask

**Dr. Sveinn Ólafsson**

School of Engineering and Natural Science  
University of Iceland, Iceland

Sveinn earned both his C.S. Electronic Engineering and B.S. Physics from the University of Iceland in 1984 and in 1986 respectively. He is currently a Research Professor in physics at the Science Institute of the University of Iceland, conducting research on growth of thin films by sputtering in general and hydrogen interactions in thin films and superlattices.

Ólafsson co-organised the International Symposium on Metal-Hydrogen Systems (MH2008) in Iceland, including many smaller meetings workshops and summer schools. He has authored and co-authored over 80 scientific papers.

# CLOSING PLENARY LECTURE



## III-Nitrides for Energy Applications

**Dr. Ian Ferguson**

Dept. of Electrical and Computer Engineering  
Missouri University of Science and Technology, United States

Dr. Ian Ferguson is the former Vice Provost and Dean of the College of Engineering and Computing at Missouri University of Science and Technology. His research has focused on the area of wide bandgap materials and devices, developing these materials for applications in the areas of illumination, solar power, spintronics, and nuclear detection. He has authored over 470 refereed journal and conference papers, book chapters, and has edited multiple conference proceedings.

Dr. Ferguson has worked with many faculty that have an interest in entrepreneurship in other institutions in the US, Asia and Europe in addition to co-founding a business incubator. He is a Fellow of Institute of Electrical and Electronic Engineering (IEEE), Fellow of Institute of Physics (FInstP), and Fellow of the International Society for Optical Engineering (SPIE).

## Smoking Policy

It is forbidden to smoke anywhere inside a building in the UK. Please smoke outside at a good distance from the hotel entrance and make use of disposal areas for cigarettes.

# SCHEDULE OVERVIEW

## Opening Remarks & Lecture

The ISECM Opening Remarks will be delivered by Dr. Henry Tan in the Kingsmills Suite at 9:00. This will be followed by a 10 minute talk by the Research Image Competition winner, Dr. Cristina Surdu-Bob, a performance of the ECM theme song “We are the Light” sung by Nils Elders. The Opening Lecture will be delivered by Prof. Dr. Theo Rasing.

### About Nils Elders

Nils started playing piano at age 5 and began writing songs at age 10. Today he is a freelance composer/producer and multi-instrumentalist that has worked professionally for 15 years in radio, TV, and independent films. He has also done writing for major US networks such as NBC & CBS.



## Lunch

A lunch buffet will be served each day for all ISECM Participants. You will receive a lunch ticket during registration on day 1. Please ensure you retain this ticket for all three days

## Welcome Reception & A1 Poster Session

We welcome you to the conference with a reception in the Kingsmills suite on Day 1 at 17:30 where you can relax and network with your fellow delegates. Light refreshments, canapés, tea and coffee will be provided alongside a cash bar for additional beverages. All registration packages are welcome to attend.

An official ISECM 2016 group photo will be taken at 18:00 for all who wish to join. In addition, the poster session will begin at 18:30. Please take the opportunity to view these as part of your evening.

## Principal Lecture

The Principal Lecture will be delivered by Dr. Sveinn Ólafsson at 8:30 on Day 2 in Kingsmills Suite.

## Closing Lecture & Awards Banquet

Both the Closing Lecture by Dr. Ian Ferguson and the Awards Banquet will take place on Day 4 at The New Drumossie Hotel. **Meet in the front car park at 10:20 to board the coaches.** We will depart promptly at 10:30, so please ensure you're on time.



### About Fiona Kennedy

The Luncheon's entertainment will feature Singer, Songwriter and Broadcaster Fiona Kennedy. Her several albums have received critical acclaim, and she has sung for Her Majesty The Queen and members of the Royal Family on a number of occasions.



# CASTLE TRIP

## Departure

For delegates attending the Castle tour, transportation to and from the Castle Trip will be provided on Day 2. **Meet in the front car park at 12:10 to board the coaches.** We will depart at 12:20 sharp, so please do not be late. **Your badge is your ticket** and must be worn at all times during the trip.

If you are unwell and/or unable to attend this part of the conference, please notify the organisers at the Information Desk.





## Castle Tour: Dunrobin Castle

Dunrobin Castle is the most northerly of Scotland's great houses and the largest in the Northern Highlands with 189 rooms. Dunrobin Castle is also one of Britain's oldest continuously inhabited houses dating back to the early 1300s, home to the Earls and later, the Dukes of Sutherland.

The Castle, which resembles a French château with its towering conical spires, has seen the architectural influences of Sir Charles Barry, who designed London's Houses of Parliament, and Scotland's own Sir Robert Lorimer. The Castle was used as a naval hospital during the First World War and as a boys' boarding school from 1965 to 1972.

A falconry Show begins outdoors at 14:00. Guided tours and a wine tasting event by Dion Wine & Spirits will take place from 14:50 - 16:50. Please ensure to dress for all weathers.

## Return Journey

Please board the coaches for our departure at 16:30. The coaches will depart from the Castle at 16:45 and return to the Kingsmills hotel.

## PROCEEDINGS

All presentation abstracts and speaker bios are available on our website:

<http://www.nscj.co.uk/ecm5>

High quality papers will be selected for publication on the open access Journal of Energy Challenges and Mechanics:

<http://www.nscj.co.uk/JECM>

## SESSION TOPICS

The following topics are arranged into Parallel Sessions:

- 01:** Energy Storage
- 02:** Photovoltaics
- 04:** Graphene-Based Nanotechnology For Energy Applications
- 05:** Fuel Cells
- 06:** Supercapacitors
- 07:** Nanomechanics
- 10:** Modelling And Simulations For Energy Applications
- 12:** Nanomaterial Design For Energy Applications
- 13:** Energy Technology
- 14:** Thermoelectrics
- 16:** High Energy Materials
- 24:** Catalysis By Nanoscale Materials
- 25:** Energy - Biology, Chemistry & Physics
- 26:** Wind Power
- 29:** Energy Saving Technology
- 33:** Dealing With Waste
- 35:** Internet Of Things

## THANK YOU

To all the delegates, committee members, and vendors of the Fifth International Symposium on Energy Challenges and Mechanics: We thank you for your support! It is only through your dedication, commitment and tireless work that this conference could be a success.

And a special thank you to the Highland Council and Visit Inverness Loch Ness for providing financial support for ISECM 2016.

visit **Inverness  
loch ness**





# SCIENTIFIC COMMITTEE & ORGANISER

## Scientific Committee

Prof. Ian Ferguson, USA  
Prof. Sang-Young Lee, South Korea  
Prof. Jun Jiao, USA  
Prof. Dr. Wolfgang Ensinger, Germany  
Prof. Sveinn Ólafsson, Iceland  
Dr. Jeongsuk Seo, Japan  
Dr. Tito Busani, USA  
Prof. Edgar Reyes-Melo, Mexico  
Dr. Jason Stoke, USA

## Organiser

North Sea Conference & Journal Ltd  
Aberdeen, Scotland, UK  
Emergency Contact Number: +44 (0)7898 700203

# PLAN YOUR SESSIONS

Use this section to plan your participation at ISECM 2016. Note which sessions you wish to attend or keep track of new colleagues.

## MY SESSION & LOCATION:

.....  
.....

## MY SESSION PICKS:

| PARALLEL | SESSION NUMBER | ROOM  |
|----------|----------------|-------|
| A        | .....          | ..... |
| B        | .....          | ..... |
| C        | .....          | ..... |
| D        | .....          | ..... |
| E        | .....          | ..... |
| F        | .....          | ..... |
| G        | .....          | ..... |

## MY NEW CONTACTS:

COLLEAGUE 1: .....  
.....

COLLEAGUE 2: .....  
.....

COLLEAGUE 3: .....  
.....

COLLEAGUE 4: .....  
.....

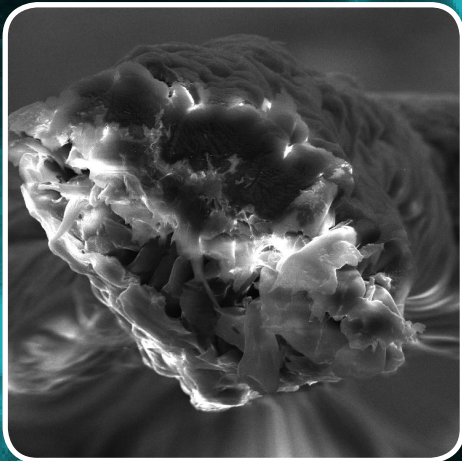
COLLEAGUE 5: .....  
.....

COLLEAGUE 6: .....  
.....

## NOTES







## RESEARCH IMAGE COMPETITION

Winner of the ISECM 5 Research Image Competition

### Micro Monster

**Authors: Dr. Cristina Surdu-Bob, Dr. Marius Badulescu, and Dr. Alexandru Anghel**

Plasma Coatings Research Group

National Institute for Lasers, Plasma  
and Radiation Physics, Romania