

# GEM15 PROGRAM

## SUNDAY FEBRUARY 3<sup>RD</sup>

15.00 – 17.00 Registration

**17.00 – 18.00 SESSION 1**                      **Chair: Steve Buckman,** Australian National University

17.00 – 17.30 **Zoran Petrovic**, Institute of Physics, Belgrade

*Spatio-temporal development of low pressure breakdown*

17.30 – 18.00 **Gustavo Garcia**, Consejo Superior de Investigaciones Científicas, Madrid

*Thermalisation of high energy electrons in H<sub>2</sub>O: from MeV to meV energies*

**18.00 – 20.00 Welcome Reception**

## MONDAY FEBRUARY 4<sup>TH</sup>

**7.00 – 8.15 Breakfast**

**8.30 – 10.30 SESSION 2**                      **Chair: Brian James,** University of Sydney

8.30 – 9.00 **Christine Charles** Australian National University

*Plasma Double Layers and Thrusters*

9.00 – 9.15 **M. Delanty**, University of Sydney

*\*\*Symmetry in Plasma Enhanced, Chemical Vapour Deposited Quantum Dot Arrays*

9.15 – 9.30 **Thomas Marynowski**, Australian National University

*\*\*Electrostatic and Optical Measurements in a Plasma Plume*

9.30 – 10.00 **Peter Teubner** Flinders University

*Electron Collision Cross Sections for Gold Vapour*

10.00 – 10.15 **Oleg F. Petrov**, Russian Academy of Sciences, Moscow

*Dusty Plasmas under Effect of External Forces: Basic Phenomena and Applications*

10.15 – 10.30 **J. Kipritidis**, University of Sydney

*\*\*Absolute densities of energetic hydrogen ion species in an abnormal hollow cathode discharge*

**10.30 – 11.00 COFFEE BREAK**

**11.00 – 13.00 SESSION 3**                      **Chair: Ron White,** James Cook University

11.00 – 11.30 **Georges Zissis**, CNRS Universite de Toulouse, France

*Progress in Electrical Discharge Light Sources Science and Technology*

11.30 – 11.45 **M. J. Hole**, Australian ITER Coordinator

*Strategic planning for Fusion Science - through ITER and beyond*

11.45 – 12.00 **K. K. F. Chan**, University of Sydney

*\*\*Plasma related effects on enhancing the coverage of 1nm Ni self-assembled islands for fabrication of dense arrays of Single-Walled Carbon Nanotubes*

12.00 – 12.30 **Ken Takiyama**, Hiroshima University, Japan

*Laser-Induced Fluorescence Spectroscopy for Electric-Field-Vector Measurements in Plasmas*

12.30 – 12.45 **M. Guenette**, University of Sydney

*\*\*Synthesis and Compositional Analysis of Thin Film M<sub>n+1</sub>AX<sub>n</sub> Phases*

12.45 – 13.00 **Maria Calafat**, Universite de Toulouse, France  
*\*\*Nanocomposites from very-low pressure dusty plasma*

**13.00 - 14.30 LUNCH**

**14.30 – 16.30 SESSION 4**                      **Chair: Rod Boswell**, Australian National University

14.30 – 15.00 **Martina Lattemann**, Royal Institute of Technology, Sweden  
*Physics of High Power Impulse Magnetron Sputtering*

15.00 – 15.15 **Uros Cvelbar**, Jozef Stefan Institute, Slovenia  
*Metal oxide nanowire growth in reactive plasma environment*

15.15 – 15.30 **John J Lowke**, CSIRO Materials Science & Engineering  
*Analysis by X-Ray Fluorescence Spectroscopy of Deposits on Timber left by Bouncing Ball Lightning*

15.30 – 16.00 **Kostya Ostrikov**, University of Sydney, Australia  
*Plasma Nanoscience: From Astronucleosynthesis to Nanoelectronics and Origin of Life*

16.00 – 16.15 **R. Kompaneets**, Max Planck Institute of Extraterrestrial Physics, Germany  
*Screening of a charged dust particle in the plasma-wall transition layer*

16.15 – 16.30 **B. Churton**, University of Sydney  
*\*\*Dust Growth in an RF Sputtering Discharge*

**16.30 – 18.00 COFFEE BREAK AND POSTER SESSION**

**19.30 DINNER (BBQ)**

**TUESDAY FEBRUARY 5<sup>TH</sup>**

**7.00 – 8.15**    **Breakfast**

**8.30 –10.30**    **SESSION 5**                      **Chair: Robert Carman**, Macquarie University

8.30 – 8.45    **Miran Mozetic**, Jozef Stefan Institute, Slovenia  
*Characterization of gaseous plasma with catalytic probe*

8.45 – 9.00    **Robert Robson**, Australian National University  
*Fluid Modelling of Plasmas and Swarms: The Big Picture*

9.00 – 9.15    **Wes Cox**, Australian National University  
*\*\*Three Dimensional Measurements of Density in a Double Layer Helicon Plasma*

9.15 – 9.30    **Brett Layden**, University of Sydney  
*\*\*Dust Cloud Dynamics in Complex Plasma Afterglow*

9.30 – 10.00    **Xiaoxia Zhong**, Shanghai Jiao Tong University, China  
*Nanoscale plasma processing: bridging nanotech and biomedicine*

10.00 – 10.15    **L. Couédel**, Universities of Sydney and Orleans  
*\*\*Diffusion in complex (dusty) plasma afterglow*

10.15 – 10.30    **Charles W. Clark**, NIST Gaithersburg  
*Observation of the  $n(^3\text{He},t)p$  Reaction by Detection of Far-Ultraviolet Radiation*

**10.30 – 11.00 COFFEE BREAK**

**11.00 – 13.00 SESSION 6****Chair: Igor Bray**, Curtin University

- 11.00 – 11.30 **Iver Cairns**, University of Sydney, Australia  
*Space Plasma Phenomena and Associated Laboratory Experiments*
- 11.30 – 11.45 **Ruth Mills**, Australian National University  
*\*\*Resolving MHD Equilibria and Stability of Stepped Pressure Profile Plasmas*
- 11.45 – 12.00 **W.J. Miloch**, Universities of Oslo and Sydney  
*\*\*Wake formation behind elongated insulating object in drifting plasmas, numerical simulations*
- 12.00 – 12.30 **Roy Newell**, University College London, England  
*Femtosecond Dynamics in Atoms and Molecules*
- 12.30 – 12.45 **Mark Tucker**, University of Sydney  
*\*\*Max Phase Alloys Deposited Using a Pulsed Cathodic Arc Plasma Source*
- 12.45 – 13.00 **R.J. Carman**, Macquarie University  
*Extreme ultraviolet (XUV) radiation source based on the 2<sup>nd</sup> emission continuum of the Ne<sub>2</sub>\* excimer ( $\lambda \sim 84\text{nm}$ ) generated by a “windowless” dielectric barrier discharge*

**13.00 – 14.30 LUNCH****14.30 – 16.30 SESSION 7****Chair: Michael Brunger**, Flinders University

- 14.30 – 15.00 **Hirotake Sugawara**, Hokkaido University, Japan  
*Electron drift along magnetically neutral channels between gradient magnetic fields*
- 15.00 – 15.15 **Patrick Neumann**, University of Sydney  
*\*\*Investigation into the use of a Pulsed Arc Source as a Spacecraft Propulsion System*
- 15.15 – 15.30 **Michael D. West**, Australian National University  
*\*\*Space Simulation Chamber Testing and Momentum Flux Measurements of the Helicon Double Layer Thruster Prototype*
- 15.30 – 15.45 **E. Tam**, University of Sydney  
*\*\*Controlled Plasma Synthesis of High Aspect Ratio Nanostructures*
- 15.45 – 16.00 **Tony Murphy**, CSIRO Materials Science & Engineering  
*The Influence of Welding Gas Composition on Arc Properties and Weld Depth in Tungsten–Inert-Gas Welding*
- 16.00 – 16.15 **Peter Caradonna**, Australian National University  
*\*\*Positron scattering from atoms and molecules*
- 16.15 – 16.30 **D. Maric**, Institute of Physics, Belgrade  
*Scaling of Micro-Discharges*

**16.30 – 17.00 COFFEE BREAK****17.00 – 18.00 SESSION 8****Chair: Marcela Bilek**, University of Sydney

- 17.00 – 17.15 **A. E. Rider**, University of Sydney  
*\*\*Tailoring the internal structure of  $A_xB_{1-x}$  quantum dots: Plasma-aided dynamic compositional control*
- 17.15 – 17.30 **Leigh Hargreaves**, Flinders University  
*\*\*Absolute Cross Sections for Electron CF<sub>2</sub> Scattering*
- 17.30 – 17.45 **B. D. Blackwell**, Australian National University  
*Alfvén range instabilities in H-1: interpretation, mode structure, and relation to rational surfaces.*
- 17.45 – 18.00 **Santhosh Kumar**, Australian National University  
*\*\*Magnetic Islands and Confinement in the H-INF Helic*

## 19.30 DRINKS AND CONFERENCE DINNER

### WEDNESDAY FEBRUARY 6<sup>TH</sup>

7.00 – 8.15 **Breakfast**

8.30 – 10.30 **SESSION 9**                    **Chair: Tony Murphy, CSIRO**

- 8.30 – 9.00 **Shuyan Xu**, Nanyang Technological University, Singapore  
*Recent advances in development of plasma technologies for fabrication of nanostructures and photovoltaic solar cells*
- 9.00 – 9.15 **Rod Boswell**, Australian National University  
*High-beta plasma effects in a low-pressure helicon plasma*
- 9.15 – 9.30 **Brian James**, University of Sydney  
*Helium beam diagnostics on H-INF*
- 9.30 – 10.00 **Frank Detering**, Australian National University  
*The use of data mining techniques in experimental plasma physics: An application to the H1-INF magnetic fusion experiment*
- 10.00 – 10.15 **K. F. Ness**, James Cook University  
*Electron Transport in Water Vapour in the presence of Electrostatic Fields*
- 10.15 – 10.30 **John Howard**, Australian National University  
*Zeeman-assisted plasma spectroscopic tomography*

10.30 – 11.00 **COFFEE BREAK**

11.00 – 13.00 **SESSION 10**                    **Chair: Robert Robson, Australian National University**

- 11.00 – 11.30 **Dmitry Fursa**, Curtin University, Western Australia  
*Electron-atom scattering calculations for plasma physics research*
- 11.30 – 11.45 **Maarten Vos**, Australian National University  
*Large-angle high-energy scattering from molecules*
- 11.45 – 12.00 **Dan Slaughter**, Flinders University  
*Superelastic Electron Scattering from Caesium*
- 12.00 – 12.15 **Cormac Corr**, Australian National University  
*Low-pressure plasma for miniature propulsion applications*
- 12.15 – 12.30 **Laurence Campbell**, Flinders University  
*Electron-Impact Vibrational Excitation of Carbon Monoxide in Planetary Atmospheres.*
- 12.30 – 12.45 **Amael Caillard**, Australian National University  
*Plasma designed fuel cell to drive the hydrogen economy*
- 12.45 Closing Remarks and Student prize Presentation

## CONTRIBUTED POSTER PAPERS

- P1** *A Study on Electron Transport Coefficients in Pure NH<sub>3</sub> and in NH<sub>3</sub>-Ar Mixtures and Electron Collision Cross Sections for NH<sub>3</sub> Molecule*  
Ryo Otsuka and Yoshiharu Nakamura
- P2** *A Very Peculiar Plasma: The Physics of Arc Cathode Spots*  
Ian Falconer
- P3** *A stepped Beltrami field model for internal transport barriers*  
M. J. Hole\*, S. R. Hudson and R. L. Dewar
- P4** *Electron Scattering from Xe at extremely high momentum transfer*  
Michael R. Went and Maarten Vos
- P5** *Calculation of the dispersion interaction between two atoms*  
J.-Y. Zhang and J. Mitroy
- P6** *Nano-Structured Electric Fields and Self-Assembly of Nanostructures in Plasma*  
I. Levchenko and K. Ostrikov
- P7** *The Physics of Non-thermionic Cathodes of Electric Arcs*  
J J Lowke and M. Tanaka
- P8** *Transport studies of magnetically filtered pulsed cathodic vacuum arc plasmas*  
R. Sanginés, M.M.M. Bilek, D.R. McKenzie, and R.N. Tarrant
- P9** *Mass-transfer evolution in quasi-2d systems in dusty plasma of RF-discharges*  
X.G. Adamovich, O.S.Vaulina, O. F. Petrov, Yu.V. Khrustalev, A.V. Gavrikov, V.E. Fortov
- P10** *Measurements of the VUV efficiency in a Xenon dielectric barrier discharge lamp by the method of Oxygen actinometry*  
R.J. Carman, B.K. Ward and D.M. Kane
- P11** *Low energy electron interactions with molecules of biological relevance*  
V. Vizcaino, J. Roberts, J.P. Sullivan and S.J. Buckman
- P12** *Near threshold electronic excitation of N<sub>2</sub>*  
S. Mondal, T. Raeside, D.S. Newman, G. Garcia and S.J. Buckman
- P13** *Ion energy distributions in mesh-assisted plasma-immersion ion implantation*  
C. Cornet, S.Y. Allan, D.R. McKenzie and M. M. M. Bilek