



14th National Congress of the Australian Institute of Physics

Adelaide University, South Australia:
December 10 — 15, 2000



**Driving Technology Through Discovery,
Understanding and Innovation**

INDIVIDUAL CONFERENCE PROGRAM

VERSION 2
(Excludes plenary sessions)

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23RD AINSE PLASMA SCIENCE & TECHNOLOGY CONFERENCE (PLASMA 2000)

Thursday, December 14, 2000

11:00 am — 12:30 pm TOKAMAKS AND STELLERATORS

VENUE: RENNIE

Chairperson: Andrew Cheetham

- 11:00 am Dr Alan TURNBULL General Atomics Inc
700 *The advanced Tokamak concept*
- 11:30 am Dr Boyd BLACKWELL Australian National University
701 *Results from Helical Axis Stellarators*
- 11:45 am Mr Scott COLLIS Australian National University
702 *Electron density transport studies on the H-INF Heliac*
- 12:00 pm Mr Fenton GLASS Australian National University
703 *Time-resolved Tomographic Spectroscopy system for H-INF*
- 12:15 pm Prof Robin STORER Flinders University of South Australia
704 *Resistive magnetohydrodynamics for three-dimensional plasmas*

2:00pm — 3:30 pm PLASMA & SPACE JOINT SESSION

VENUE: CINEMA, LEVEL 5

Chairperson: Brian Fraser

- 2:00 pm Prof Peter ROBINSON University of Sydney
936 *Stochastic growth of localized plasma waves*
- 2:30 pm Prof Manfred HELLBERG University of Natal
937 *Waves in plasmas with power-law distributions*
- 2:45 pm Dr Murray SCIFFER University of Newcastle
938 *One dimensional model for ULF wave propagation in the ionosphere*
- 3:05 pm Mr Phillip WEBB La Trobe University
939 *The Global Plasmasphere Ionosphere Density (GPID) model*

4:00 pm — 5:30 pm DUSTY PLASMAS AND PLASMA THEORY

VENUE: RENNIE

Chairperson: Robin Storer

- 4:00 pm Mr Nathan PRIOR Flinders University of South Australia
705 *Oscillations of particles in a dusty plasma*
- 4:15 pm Dr Neil CRAMER University of Sydney
706 *Plasma kinetics around a dust grain in an ion flow*
- 4:30 pm Dr Alex SAMARIAN University of Sydney
707 *Strongly coupled Coulomb systems with positive dust grains: Thermal and UV-induced Plasmas*
- 4:45 pm Ms Sally LLOYD Australian National University
708 *The response of magnetic islands to pressure change*
- 5:15 pm Mr Rod BOSWELL Australian National University
709 *Communication systems and the role of plasma processing*

Friday, December 15, 2000

11:00 am — 12:30 pm **23RD AINSE PLASMA SCIENCE & TECHNOLOGY CONFERENCE (PLASMA 2000)**
RF PLASMA PHYSICS

Friday, December 15, 2000

11:00 am — 12:30 pm **RF PLASMA PHYSICS**

VENUE: RENNIE

Chairperson: Jeffrey Harris

- 11:00 am Dr Gerard BORG Australian National University
710 *An overview of plasma antenna research*
- 11:30 am A/Prof Andrew CHEETHAM University of Canberra
711 *Surface wave excitation for plasma antenna applications*
- 11:45 am Dr Kostyantyn OSTRIKOV Nanyang Technological University
712 *Mode transitions and power transfer in low-frequency inductively coupled plasmas*
- 12:00 pm Mr Erekle TSAKADZE NIE, Nanyang Technological University
713 *Inductively coupled plasmas in a cylindrical resonator with phase-varying radio-frequency currents*

12:15 pm — 12:30 pm **POSTER SESSION**

VENUE: GAMES, LEVEL 5

- TF 160** Dr Boyd BLACKWELL Australian National University
Computers in plasma physics: Remote data access and magnetic configuration design
- TF 161** Dr Boyd BLACKWELL Australian National University
The H-1 National Plasma Research Facility
- TF 162** Mr Felix CHEUNG Flinders University
The rotation of dust plasma crystals in an axial magnetic field
- TF 163** Dr Neil CRAMER University of Sydney
The equilibrium and oscillations of dust grains in a discharge
- TF 164** Dr Neil CRAMER University of Sydney
Dynamics of a macroparticle in a plasma flow
- TF 165** Dr Neil CRAMER University of Sydney
Dust - crystal experiments in a RF - discharge plasma
- TF 166** Prof Robert DEWAR The Australian National University
Global ballooning modes in a low-shear stellarator
- TF 167** Peter FENG La Trobe University
High power laser raman scattering from a Rarefied plasma
- TF 176** Liviu LUNGU Australian National University
Investigation and design of a variable microwave plasma lens
- TF 168** Prof Lance MCCARTHY Flinders University
The Flinders Spherical Tokamak target plasma for RMF current drive tests
- TF 169** Dr Frederick OSMAN University of Western Sydney Nepean
Geometric phases and monodromy at singularities in laser atom interactions
- TF 170** Dr Kostyantyn OSTRIKOV Nanyang Technological University
Standing surface waves in dusty microwave slot-excited plasmas
- TF 171** Mr Horst PUNZMANN Australian National University
Multi-channel spectroscopy diagnostic for line intensity ratio measurements
- TF 172** Dr John RAYNER University of Canberra
Antenna matching for a helicon plasma source
- TF 173** Dr Alex SAMARIAN University of Sydney
The changing of dust particles in plasma sheath
- TF 174** Dr Alex SAMARIAN University of Sydney
Instabilities in dusty plasma with the spatial variation of grain charges

Friday, December 15, 2000

12:15 pm — 12:30 pm **23RD AINSE PLASMA SCIENCE & TECHNOLOGY CONFERENCE (PLASMA 2000)** **POSTER SESSION**

TF 175 Dr George WARR Australian National University
Electron density Tomography on the H-INF Helic

2:00 pm — 3:30 pm PLASMA APPLICATIONS **VENUE: RENNIE**

Chairperson: Boyd Blackwell

- 2:00 pm Mr Matthew HOLE University of Sydney
714 *Review of plasma phenomena in vacuum Arc centrifuges*
- 2:15 pm Dr Ian FALCONER University of Sydney
715 *The nature of the discharge in a Plasma display panel pixel*
- 2:30 pm Dr Ian FALCONER University of Sydney
716 *Filaments and feelers: uv and visable imaging of Xe excimer dielectric barrier discharge lamps*
- 2:45 pm A/Prof Matthew FEWELL University of New England
717 *First results on nitriding aluminium alloys in a low-pressure rf plasma*
- 3:00 pm A/Prof Brian JAMES University of Sydney
718 *A spectroscopic study of a high-voltage fuse arc*
- 3:15 pm Mr Matthew COLLINS University of Western Sydney
719 *Guassian beams and electron acceleration*
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4:00 pm — 5:30 pm PLASMA DIAGNOSTICS **VENUE: RENNIE**

Chairperson: Ian Falconer

- 4:00 pm Mr Clive MICHAEL Australian National University
720 *The MOSS camera for ion thermal transport studies on the H-1NF Helic*
- 4:15 pm Mr Andreas DANIELSSON Australian National University
721 *Measurement of vector B using Zeeman effect and optical coherence techniques*
- 4:30 pm Mr Richard TARRANT University of Sydney
722 *Optical spectroscopy of a cathodic arc*
- 4:45 pm Dr Mohammad NADEEM Chalmers University of Technology
723 *Drift waves in plasma*
- 5:00 pm Mr Daniel ANDRUCZYK The University of Sydney
724 *A supersonic He probe beam for L/F measurements of electric fields in plasmas*
- 5:15 pm Mr Wayne SOLOMON Australian National University
725 *Plasma characterisation using combined Mach/Triple probe techniques*