



# 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)

To find an author, or topic, select the  
binoculars button

### ATOMIC & MOLECULAR PHYSICS & QUANTAM CHEMISTRY (AMPQC)

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Tuesday, December 12, 2000

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**11:00 am — 12:30 pm VENUE: BONYTHON HALL**

- 11:00 am Dr Birgit LOHMANN Griffith University  
**100** *Ionization of heavy rare gases - a challenge to theory*
- 11:30 am Dr Helen DORSETT DSTO  
**101** *Detonation chemistry*
- 12:00 pm Prof William MACGILLIVRAY Griffith University  
**102** *New electron-atom collision experiments involving lasers*

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**2:00 pm — 3:30 pm VENUE: BONYTHON HALL**

- 2:00 pm Dr Robert SANG Griffith University  
**103** *Total absolute electron-metastable neon collision cross section measurements via a magneto-optical trap*
- 2:15 pm Dr David WATERHOUSE University of Western Australia  
**104** *Long-range Coulomb interactions in low energy (e,2e) data*
- 2:30 pm Dr Julian LOWER Australian National University  
**105** *(e,2e) Collisions with polarized electrons and excited, oriented and spin polarized targets*
- 2:45 pm Mr Matthew HAYNES Griffith University  
**106** *Low energy electron impact ionization measurements of argon in coplanar symmetric and asymmetric geometries*
- 3:00 pm Dr Robert GULLEY Australian National University  
**107** *Absolute electron scattering from C<sub>6</sub>H<sub>6</sub> and C<sub>6</sub>F<sub>6</sub>*
- 3:15 pm Ms Linda UHLMANN Australian National University  
**108** *Absolute elastic cross sections for electron scattering from SF<sub>6</sub>*

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**4:00 pm — 5:30 pm VENUE: BONYTHON HALL**

- 4:10 pm Dr John FURST University of Newcastle  
**109** *Measuring Zero: How photon polarisation measurements provide an insight into the dynamics of electron scattering from the rare gases*
- 4:15 pm Dr Dmitry FURSA The Flinders University of South Australia  
**110** *Electron scattering from the ground state of mercury*
- 4:30 pm Dr Bipina DHAL University of Melbourne  
**111** *Competitive channel of double electron transfer in ion-atom collision*
- 4:45 pm Dr Alisher KADYROV Flinders University  
**112** *Convergent close-coupling: extension to positron-hydrogen*
- 5:00 pm Mr Anthony BLACKETT Murdoch University  
**113** *Solving the momentum-space Lippman-Schwinger equation using a rotated-contour method*

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Thursday, December 14, 2000

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## Thursday, December 14, 2000

11:00 am — 12:30 pm **ATOMIC & MOLECULAR PHYSICS & QUANTAM CHEMISTRY (AMPQC)**

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### 11:00 am — 12:30 pm **VENUE: BONYTHON HALL**

- 11:00 am Prof Gerard MILBURN The University of Queensland  
**115** *Quantum phase transitions in an ion trap*
- 11:30 am Prof Victor FLAMBAUM University of New South Wales  
**116** *Do fundamental constants vary with time and distance?*
- 12:00 pm Dr Victor KARAGANOV Flinders University  
**117** *Superelastic scattering of electrons from laser excited alkali atoms*
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### 2:00 pm — 3:30 pm **VENUE: BONYTHON HALL**

- 2:00 pm Mr Peter RIGGS Department of Defence  
**118** *Quantum phenomena in terms of energy - momentum transfer*
- 2:15 pm Mr Michael BROMLEY Northern Territory University  
**119** *Configuration interaction calculations of positronic atoms and ions*
- 2:30 pm Dr Andrey LUGOVSKOY Flinders University  
**120** *Shake-up of a light atom in a collision with a hard wall*
- 2:45 pm Mr Ben TRAVAGLIONE University of Queensland  
**121** *Applying Kitaev's algorithm in an ion trap quantum computer*
- 3:00 pm Prof Peter DRUMMOND University of Queensland  
**122** *STIRAP in coupled atomic and molecular superchemistry*
- 3:15 pm Mr Chanh Quoc TRAN University of Melbourne  
**123** *X-ray extended-range technique for precision measurement of the x-ray mass attenuation coefficient and  $IM(F)$  for copper using synchrotron radiation*
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### 4:00 pm — 5:30 pm **VENUE: BONYTHON HALL**

- 4:00 pm Mr Winfried HENSINGER The University of Queensland  
**124** *Single atom phase space tunneling*
- 4:15 pm Dr Howard WISEMAN Griffith University  
**125** *Reducing the linewidth of an atom laser by feedback*
- 4:30 pm Ms Jacinda GINGES University of New South Wales  
**126** *Calculation of parity nonconserving s-d transitions In Cs, Fr, Ra II, and Ba II*
- 4:45 pm Dr Vladimir DZUBA University of New South Wales  
**127** *Atomic theory and test of the standard model*
- 5:00 pm Dr Christopher CHANTLER University of Melbourne  
**128** *What is wrong with the fundamental constants of nature?*
- 5:15 pm Dr David PATERSON University of Melbourne  
**129** *High-accuracy absolute test of Quantum Electrodynamics for helium-like and hydrogenic vanadium using the NIST electron-beam ion trap*
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## Friday, December 15, 2000

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### 11:00 am — 12:30 pm **VENUE: BONYTHON HALL**

- 11:00 am A/Prof Andris STELBOVICS Murdoch University  
**130** *How to calculate electron-atom ionisation*
- 11:30 am Dr Anatoli KHEIFETS The Australian National University  
**131** *Two-electron photoionization from correlated atomic targets*
- 12:00 pm Dr Jamal BERAKDAR Max-Planck Institute  
**132** *Two particle wave function engineering*
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**Friday, December 15, 2000**

**2:00 pm — 3:00 pm ATOMIC & MOLECULAR PHYSICS & QUANTAM CHEMISTRY (AMPQC)**

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**2:00 pm — 3:00 pm VENUE: BONYTHON HALL**

- 2:00 pm Dr Peter HAMMOND University of Western Australia  
**133** *Radiative decay of doubly excited states*
- 2:30 pm Dr Maarten HOOGERLAND Australian National University  
**134** *Electron scattering from laser cooled metastable helium atoms*
- 3:00 pm Dr Harry QUINEY University of Melbourne  
**135** *Relativistic molecular quantum electrodynamics: light, and the heavy elements*
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**4:00 pm — 5:30 pm AMPQC POSTER SESSION  
VENUE: GAMES, LEVEL 5**

- TF 110** Dr Jamal BERAKDAR Max-Planck Institute  
*On the many-body Green operator of few interacting particles*
- TF 111** Dr Laurence CAMPBELL Flinders University of SA  
*Vibrational-electronic excitation of NO and N2 by electron impact*
- TF 180** Mr Max COLLA Australian National University  
*Low energy electron scattering from cold metastable helium atoms : total cross section measurements*
- TF 112** Dr Vladimir DZUBA University of New South Wales  
*Atomic clocks and search for variation of the fine structure constant*
- TF 113** Dr Vladimir DZUBA University of New South Wales  
*Calculation of positron binding to copper, silver and gold atoms*
- TF 114** Dr Vladimir DZUBA University of New South Wales  
*Enhancement of parity and time invariance violation in radium*
- TF 115** Prof Victor FLAMBAUM University of New South Wales  
*Chaotic many-body states as a source of strong enhancement of electron recombination with multicharged ions*
- TF 116** Prof Victor FLAMBAUM University of New South Wales  
*Cold-atom scattering: from the scattering length to the glory oscillations*
- TF 179** Mr Jay GAMBETTA Griffith University  
*Super elastic scattering from the 5P levels of atomic rubidium*
- TF 117** Mr Nathaniel GROOTHOFF Griffith University  
*Superelastic scattering from the 5P Levels of atomic rubidium*
- TF 118** Dr Robert GULLEY Australian National University  
*Very low energy electron scattering in nitromethane, nitroethane and nitrobenzene.*
- TF 119** Dr Radmila PANAJOTOVIC Australian National University  
*Experimental investigation of temporary negative ions in electron scattering from magnesium atoms*
- TF 120** Ms Holly ROSE University of Western Australia  
*Measurements of scattering parameters of the He(33D) and He(41,3F) states*
- TF 121** Mr Tony SHACKLETON Murdoch University  
*Failure of the n3 scaling law in the Temkin-Poet model of e-H scattering*
- TF 122** Drs Erik VAN OOIJEN University Utrecht  
*Dynamical spectroscopy in an optical lattice*
- TF 123** Mr Michael WENT Griffith University  
*Complete electron rubidium collision experiments*
- TF 124** Dr Dehong YU University of Western Australia  
*Electron exchange in the dissociation and excitation of molecules by polarized electrons*