

# CD ROM Index



# **High Power Laser Science**

# Femtosecond Pulse Physics

- 1 High-density, ultra-relativistic positron beams using the Astra-Gemini laser
- 2 X-Ray measurements of the interaction of the Astra-Gemini pulse with large atomic clusters
- 3 Relativistic electron beams with low energy spread by ionisation injection in a structured gas cell
- **4** Extended guiding of ultra-intense laser pulses up to 4 cm in a gas cell
- 5 Optically-Stimulated Side Scatter in a Laser Wakefield Accelerator
- 6 Relativistic Raman Side Scatter Measurements in a Laser Wakefield Accelerator
- 7 High Energy, High Charge Electrons and Energetic X-rays from a Density Tailored Gas Target
- 8 Thorough Calibration of a Scintillating Lanex Screen as an Electron Bunch Charge Diagnostic
- 9 Generation of giant attosecond pulse from laser-driven relativistic electron sheets
- 10 Radiation Pressure of Relativistically Intense Lasers
- 11 Hole-boring at high intensity in near-critical density targets

# High Energy Laser Interactions

- 12 Fast electron injection and transport angles in high intensity laser-solid interactions
- 13 Laser specular reflectivity as a function of target Z
- 14 Ion beam characterisation from ultra-thin plasticfoil targets under direct illumination with the Vulcan Petawatt
- 15 Probing the solid-liquid transition of carbon at ~150 GPa pressure using spectrally resolved X-ray scattering

# Theory and Computation

- 16 Flux-Limited Heat-flow and Magnetic-Field Transport in Laser-Plasmas
- 17 Quantum radiation reaction in laser-electron beam collisions
- **18** Angular distribution of high harmonics generated during laser-preplasma interaction
- 19 Simulations of synchrotron radiation effects in 10PW+ laser solid interactions

- 20 Ultrafast processes: time dependent R-matrix methods
- 21 Recent developments in Lorentz-Abraham-Dirac fluid theory
- 22 The role of collisionless electrostatic shocks in laserplasmas
- 23 Creating Hollow atoms with a petawatt laser
- **24** Advanced Models for the Effective Ionisation Energy in Dense Plasmas
- **25** Efficient laser pulse amplification by stimulated Brillouin scattering
- **26** Vacuum Birefringence Revisited
- 27 Simulating driving Plasma Wakefield Acceleration with the Diamond Beam
- **28** Effect of collisions on amplification of laser beams by Brillouin scattering in plasmas
- **29** An R-matrix with pseudo-states (RMPS) approach for single photon double ionization of the He-like Li<sup>+</sup> ion
- **30** Radiation damping of an electron in an intense laser pulse
- 31 The inclusion of gamma-ray photon emission and pair production in simulations of high power laser matter interactions
- **32** Generation of Super-Ponderomotive Electrons via Direct Laser Acceleration with Longitudinal Electrostatic Fields
- Control of Relativistic Electron Beams for Fast Ignition using Elliptical Magnetic Mirrors
- Numerical Modeling of the Sensitivity of X-Ray Driven ICF Implosions to Low-Mode Flux Asymmetries
- **35** Using k-alpha emission to determine fast electron spectra using the Hybrid code ZEPHYROS
- **36** Simulations of ring structures produced in proton acceleration from dense targets

## Ultrafast and XUV

- **37** Hydrogen bond dynamics in water
- **38** Snapshots of non-equilibrium Dirac carrier distributions in grapheme
- 39 Watching Hot Electrons Decay on the Dirac Cone in Graphene
- **40** UV pump XUV probe photoelectron spectroscopy
- **41** Two-colour HHG spectroscopy and wavelength dependence of HHG in aligned molecule

# **Lasers for Science Facility Programme**

## Biology

- **42** Gold Nanoparticle Uptake and Mechanism Elucidation
- **43** The use of FLIM to measure the stabilities of metal complexes in living cells
- The plant secretoryome Part II: Golgi stack N-glycosylation enzymes interaction studies using Fluorescence Lifetime Imaging Microscopy
- **45** Characterisation of small fluorescent protein iLOV for use in fluorescence lifetime imaging applications
- **46** Ultrasensitive Dark-Field Microspectroscopy with a Super Continuum Source
- 47 Imaging of Z-combretastatin induced apoptosis upon twophoton activation of E-combretastatin pro drugs

# Chemistry

- 48 Photodesorption and dissociation from a graphite surface
- 49 The role of a heme pocket lysine residue during the geminate recombination of NO in the hemoprotein cytochrome c'
- **50** Dynamics of Chemical and Photochemical Reactions in Solution
- **51** Time-resolved vibrational spectroscopy of Trolox C photoionization
- 52 Intra- and Intermolecular Photoinduced Electron Transfer Acceleration in Azurin Mutants Labeled with a Recarbonyl-diimine Chromophore

## Physics

- **53** Coherence studies of pulsed electron beams from point sources
- 54 Ultrafast spectroscopy of plasmonic nanoantennas using the Pharos/Orpheus laser
- **55** Manipulation of a continuous beam of molecules by light pulses

# Laser science and development

#### Astra Gemini

- 56 Target Alignment in Astra-Gemini
- 57 Measurement of the difference in the Gemini gate valve windows thickness by its effect on timing between the North and South beams
- 58 Analysis of thermal lens in the Gemini amplifier under high repetition pump rate
- 59 Development of dielectric-coated adaptive mirrors
- 60 Monitoring Astra Gemini with penguin
- 61 Adaptive optic developments for the Astra Gemini target area
- **62** Implementation of adaptive optics on the Astra-Gemini beamlines
- 63 Modified Cross-correlator for use on Beam Combination Experiment

#### **DiPOLE**

64 Multislab Yb:YAG crogenic gas cooled high average high power amplifier 7.4 J at 10 Hz

# Engineering

- 65 Remotely Controlled Gas System for High Repetition Rate Experiments
- 66 TAP Vacuum Improvements

#### Instrumentation

- 67 Dynamic range and sensitivity comparison of optical CCDs
- 68 Gamma-ray Scintillator Spectrometer
- 69 Wavefront Sensor-less Adaptive Optics for High Powered Lasers

## **LSF**

- 70 Waveguide-Enhanced 2D-IR Spectroscopy for the Gas-Phase
- 71 Ultrasensitive dark-field microspectroscopy with a supercontinuum source

## Plasma Diagnostics

- 72 Improvements in Thomson Parabola studies: a new ImageJ script for spectral energy analysis and measurements using a double Image Plate detector
- 73 Use of Bubble detectors to Generate Neutron Spectra from High Power Laser Sources
- 74 Temporally and spatially resolved measurements of fast electron dynamics using a chirped optical probe
- 75 Investigations into Generation of Neutron Spectra from High Powered Laser Sources via the Use of Activation Foils

## **Target Fabrication**

- 76 Micro-grating structures as laser targets and diagnostic devices
- 77 Production and Characterisation of Diamond-Like Carbon Foils for Experimental Delivery
- 78 Initial Set-up of a Droplet Generator

#### Vulcan

- 79 Large Temporal Window Near Field Autocorrelator
- 80 Construction of a pump amplifier chain for the 10 J OPCPA beamline
- 81 Modelling and performance of a Regenerative Amplifier Laser Cavity and the rod amplifier chain for the 10 J OPCPA pump laser and development of Arbitrary Waveform Generator control software
- 82 High Repetition Rate Diagnostics for the Vulcan Laser