Position Description

School of Physics
The University of Melbourne

ASTRONOMY GRID RESEARCH PROGRAMMER

Position No:	Y0014355
Organisation Unit:	The School of Physics
Budget Division:	Faculty of Science
Classification:	Research Assistant Grade 2 (Level A)
Salary:	$41,264 - $55,998 p.a.
Superannuation:	Employer superannuation contributions of 9 percent.
Employment Type:	This is a full-time (fixed-term) position available for 12 months.
Other Benefits:	Salary packaging and staff training and development opportunities.
Current Occupant:	Vacant
Advice to applicants:	Send applications to: **Vice-Principal (Human Resources), The University of Melbourne Victoria 3010 email hr-applications@unimelb.edu.au or fax +61 3 8344 6080.** Applicants must address the selection criteria and provide a detailed curriculum vitae by the closing date. Please quote the position number and include the names, phone, facsimile numbers and email addresses of three referees in your application.
For enquiries contact:	Dr David Barnes, tel. +61 3 8344 5428, fax. 9347 4783, email barnesd@unimelb.edu.au
Closing Date:	19 July 2004

1 Position Summary

The methodical archiving, publishing and analysis of large datasets in astronomy is one of the major challenges confronting observatories and astronomers in the 21st century. A key element in this activity will be the development and deployment of Compute and Data Grid infrastructure, providing authenticated and authorised access to storage and processing resources to Australian astronomers and astrophysicists. The Australian Astronomy & Astrophysics Grid Program, formed in 2004 with funds from the Australian Partnership for Advanced Computing (APAC), has been established to address these needs. The partners include The University of Melbourne, Swinburne University of Technology, The Australian National University, The University of Sydney and the University of New South Wales, sharing a total of four programmer positions.

This position (Research Assistant Grade 2) is available in the School of Physics at The University of Melbourne. The successful applicant will be expected to play a significant and active role in the selection and deployment of Grid technologies for data warehousing in the context of Australian astronomy.

The work will include, but is not limited to:

- developing local expertise in Grid technologies, especially the Globus toolkit and alternatives where appropriate;
- developing and implementing a Grid authentication and authorisation strategy and mechanism for astronomy data warehouse access;
- deploying selected Australian astronomy datasets (eg. the Australia Telescope Compact Array archive, Pulsar Timing archives, HIPASS raw data archive) on the Australian Grid;
- assisting Australian Virtual Observatory staff to publish Australian astronomy datasets;
- exploring access techniques (eg. GridFTP, Storage Resource Broker, ...) to these and other datasets and deploying the most useful;
- testing and deploying AstroGrid's MySpace for use by the theory portal being developed at Swinburne and pipelines being developed elsewhere;
- assisting with the implementation and deployment of Simple Image Access Protocol for the SUMSS catalogue images, and of Simple Spectral Access Protocol for 2QZ and HIPASS spectra;
- collaborating with colleagues in the APAC Grid Program and actively contributing identified needs and requirements to the APAC Compute Infrastructure projects;
- supporting and collaborating with Australian Virtual Observatory members and partners as required; and
- undertaking other relevant duties as directed by the position supervisor.

The occupant of the position is expected to exhibit initiative in exploring methodologies to achieve the stated goals, to develop a local base of expertise in relevant techniques, and to document their work in a manner suitable to be used as a reference by the Australian astronomy community (especially Aus-VO and APAC Astronomy Project members) and the wider Australian scientific Grid community.

The ideal applicant for this position will have a combination of excellent Unix computing skills and modern language programming skills, an appreciation of, if not direct experience with, large scientific (especially astronomy) datasets, and a desire to work in e-science – where the scientific and grid computing domains meet. Prospective candidates with a higher degree in the physical sciences (especially astronomy) are particularly encouraged to apply.

2 Selection Criteria

2.1 Essential

- Bachelor Degree in Science, Computer Science or Software Engineering.
- Practical proficiency in Linux (or other Unix) system administration.
- Thorough knowledge and extensive experience in downloading, configuring, compiling and using and/or supporting Open Source software in a Linux environment.
- Strong computational and numerical skills.
- Proficiency in at least one of Java or C++.
- Demonstrated record of successful interactions with research groups.
- Ability and desire to explore and document multiple solutions to unique problems.
- Good interpersonal skills
- Good communication skills.
- Ability to work in a geographically distributed team.

2.2 Desirable

- A higher degree (Masters or PhD) in the physical sciences.
- Knowledge of Grid architecture and contributing technologies.
- Practical experience with additional programming languages, such as Python, Perl, C, FORTRAN.
- Experience with web and metadata standards (eg. XML) and dynamic web-interface construction with Java Servlet Technology.
- Practical experience (especially configuration and installation) with Grid middleware (eg. Globus, Condor, Gridbus, Nimrod).
- Practical experience with large scientific datasets, and an appreciation of large data-set management issues such as backup, replica management, resource management, and data consistency and integrity.

- Evidence of prior development of web interfaces to large and complex metadata collections.
- Prior experience working with astronomy research groups.
- Strong initiative to learn and understand new approaches.

3. Special Requirements

- Nil

4. Key Responsibilities

- Explore and deploy Grid middleware to enable authenticated and authorised publication of and access to Australian astronomy data resources.
- Develop and deploy implementations of International Virtual Observatory Alliance protocols as they apply to Australian astronomy data collections and the Australian Grid.
- Collaborate with and support colleagues in the APAC Grid Program and in the Australian Virtual Observatory.
- Develop a local expertise resource in Grid-based data warehousing.
- Liase with colleagues at Swinburne University of Technology to provide Grid-based data storage infrastructure for use by theory portal/s.
- Document successful and unsuccessful approaches to tasks undertaken.

Environmental, Health and Safety Responsibilities
All staff are responsible for the following safe work procedures and instructions:

Employees are to:

- comply with the EHS manual
- adopt work practices that support EHS programs
- take reasonable care for the safety of his/her own health and safety and that of other people who may be affected by their conduct in the workplace
- seek guidance for all new or modified work procedures
- ensure that any hazardous conditions, near misses and injuries are reported immediately to the supervisor
- participate in meetings, training and other environment, health and safety activities

Employees:

- must not wilfully place at risk the health or safety of any person in the work place
- must not wilfully or recklessly interfere with or misuse anything provided in the interest of environment health and safety or welfare

- must cooperate with the University in relation to activities taken by the University to comply with Occupational, Health and Safety and environmental legislation.

In addition, ACADEMIC STAFF are responsible for ensuring that an equivalent stardard of environment, health and safety is afforded to their students as is afforded to University staff generally. Academic staff are deemed to have principal supervisory duty for undergraduate and postgraduate student activities.

5 Other Information

5.1 Organisation Unit

The University of Melbourne's School of Physics offers a wide range of physics subjects to undergraduate and postgraduate students. It is located in a modern building on the Swanston Street boundary of the University campus. Currently some 24 academic staff, 24 support staff, 28 research-only staff, and more than 80 postgraduate students make up the Department

The School is a dynamic research and teaching department that attracts considerable research funds in the areas of Materials Science and Condensed Matter Physics, X-ray, Visible and Atom Optics; Experimental Particle Physics; Theoretical Physics; Astrophysics and theoretical and experimental aspects of Quantum Computing. The School of Physics has extensive facilities to support research in these areas. The School is a key node of the Australian Centre of Excellence for Quantum Computer Technology and fully participates in the Australian Synchrotron Research program.

The teaching and research activities of the school are supported by skilled, administrative, laboratory and technical staff.

5.2 Budget Division

The Faculty of Science is one of the larger faculties of the University and has some 3,000 undergraduate and postgraduate students. There are four schools and five departments; they are the Schools of Botany, Chemistry, Earth Sciences and Physics, and the Departments of Genetics, Information Systems, Mathematics and Statistics, Optometry and Zoology.

5.3 The University of Melbourne

The University of Melbourne is an international research and teaching university. We employ people of outstanding calibre and offer a unique environment where staff are valued and rewarded.

Founded in 1853, the University commenced teaching its first students in 1855. Now, the University has over 40,000 students in a broad range of professional disciplines. Over 6000 students are higher degree students. The University has over 6000 staff members.

The University is Australia's leading research based university, with an international profile through its reputation for scholarship and teaching. It is a founding member of Universitas 21, an international federation of universities.

The University is committed to equal opportunity in education, employment and welfare for staff and students. Students are selected on merit and staff are selected and promoted on merit.

The Vice Chancellor is the Chief Executive Officer of the University and responsible to Council for governance. The Academic Board is responsible to Council for academic matters. Reporting to the Vice-Chancellor are the Deans of each Faculty, three Deputy Vice-Chancellors, and the Senior Vice-Principal. Reporting to the Senior Vice-Principal are Vice-Principals of Human Resources, Information, Property & Buildings, and University Development; the Vice-Principal & Chief Financial Officer; the Vice-Principal & General Counsel; and the Vice-Principal & Academic Registrar.

This position description is approved by:

Occupant: ..... Date: .....

Supervisor: ..... Date: .....

Head of Organisation Unit: ..... Date: .....

Head of Budget Division: ..... Date: .....