GREGORY B. POOLE

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PROFESSIONAL SUMMARY

I have extensive experience conducting large computational projects and developing software for high-performance computing applications. I take pride in my interpersonal skills; excellent written and verbal communication abilities; and my diverse research background, developed through a long history of adapting to new and challenging problems.

PROFESSIONAL PROFICIENCIES

PROJECT MANAGEMENT & LEADERSHIP
Significant experience managing computing projects through: designing & leading several very large simulation programs; management of several graduate students (training them in computing, research and writing techniques; identifying goals and tasks; and overseeing performance); and the management (in an Agile environment) of ~10 diverse small-medium scale HPC & web projects (and the national program hosting them) in my current role.

COMMUNICATION
Excellent communication skills developed through: publication in peer reviewed journals, lecturing at conferences & invited colloquia, teaching (to both science and non-science majors), public outreach activities, authoring grant proposals and graduate student supervision.

STAKEHOLDER ENGAGEMENT
Significant participation on national committees tasked with informing the primary stakeholders of Australian astronomy (and making decisions on their behalf) on matters regarding the status, capabilities, priorities, and acquisition of high-performance computing (HPC) infrastructure.

TECHNICAL PROFICIENCIES

HPC COMPUTING
A decade of experience with distributed/multi-threaded/heterogeneous high-performance computing in large cluster environments. Jobs have involved up to 4k cores & 16Tb of RAM.

LARGE DATASETS
Designed, lead and executed several large computational projects; datasets up to 100Tb in size.

DEVELOPMENT TOOLS
Languages: Primarily C/C++ & Python. HPC: Message Passing Interface (MPI), CUDA (including NVIDIA-accredited training) & OpenMP. Web development (experience more limited): HTML5, Javascript, jQuery, CSS, SASS & Django.

EDUCATION

UNIVERSITY OF VICTORIA **Victoria, British Columbia, Canada**
PhD in Astrophysics September 1999 – December 2006

- Awarded the Governor General's Gold Medal, in part due to a perfect Grade-Point Average (GPA).
- My thesis (titled "*The Impact of Mergers on Relaxed X-ray clusters*") presented a detailed analysis of hydrodynamical simulations of collisions between large clusters of galaxies.
- For more information, see *www.astronomy.swin.edu.au/~gpoole/thesis.html*.

UNIVERSITY OF TORONTO **Toronto, Ontario, Canada**
MSc in Astrophysics September 1998 – August 1999

- My thesis (titled "*A Ray Optics Formalism for Wave Tails*") developed a sophisticated mathematical formalism for accurately describing the propagation of beams of light in curved space-times.

UNIVERSITY OF WATERLOO **Waterloo, Ontario, Canada**
BSc in Applied Physics September 1992 – April 1997

- This co-op degree also provided 2 years of work experience, maintaining a corporate SQL database for a large telecommunications company (Telesat Canada), conducting research in synthetic aperture radar (SAR; at the Canadian Centre for Remote Sensing) and magnetic resonance imaging of breast cancer (Sunnybrook Hospital).

POSTGRADUATE WORK EXPERIENCE

SWINBURNE UNIVERSITY OF TECHNOLOGY   **Melbourne, Victoria, Australia**
ADACS Project Scientist   March 2017 – present

- Manage and contribute to the programming efforts of the ADACS Software Solutions Program (SSP) - a national merit allocation scheme providing access to professional software developers for astronomers across the country.
- Liaise with cloud computing provider Alibaba to explore options for Australian astronomy researchers.
- Provide support for the C++ backend of the Theoretical Astrophysical Observatory (TAO)
- For more information about ADACS, see *adacs.org.au*.

UNIVERSITY OF MELBOURNE   **Melbourne, Victoria, Australia**
Postdoctoral Researcher   July 2012 - Dec 2016

- Managed the creation and lead all software development for the Tiamat simulation suite: the largest Australian astronomy simulation program published to-date, and a unique resource for studying high-z galaxy formation.
- Contributing renderer and co-star of the IMAX film, Hidden Universe (see *www.hiddenuniversemovie.com*).
- Co-supervised one graduate student to completion: Paul Angel (PhD).
- Conducted lectures to both non-science-major undergraduate, and astronomy graduate students.
- For more information about Tiamat, see *www.astronomy.swin.edu.au/~gpoole/Tiamat.html*.

SWINBURNE UNIVERSITY OF TECHNOLOGY   **Melbourne, Victoria, Australia**
Postdoctoral Researcher   July 2007 – July 2012

- Designed, executed and lead all software development for the Gigaparsec WiggleZ (GiggleZ) simulation suite: the first "grand-challenge"-scale (>10 billion particle) astronomy simulation ever conducted in Australia.
- Co-supervised two graduate students to completion: Peter Jensen (MSc) and Simon Mutch (PhD).
- For more information about GiggleZ, see *www.astronomy.swin.edu.au/~gpoole/GiggleZ.html*.

COMMITTEES OF NATIONAL SIGNIFICANCE

AUSTRALIAN eRESEARCH ADVISORY COMMITTEE (AeRAC)   2015-2018

- Advised Astronomy Australia Limited on matters regarding HPC and curation of datasets of national importance.

ASTRONOMY DATA AND COMPUTING SERVICES (ADACS) SELECTION COMMITTEE   Oct-Dec 2016

- Evaluated expressions of interest and interviewed short-listed groups responding to an AAL request for tender to "provide discipline-specific training, support and expertise" for a national infrastructure initiative.

COMPUTING INFRASTRUCTURE PLANNING WORKING GROUP (CIPWG)   2015-2016

- Contributed to a report advising the Australian astronomy community on computing infrastructure investments.

2016-2025 DECADAL PLAN FOR AUSTRALIAN ASTRONOMY - eSCIENCE WORKING GROUP   2013-2014

- Advised the National Committee for Astronomy on matters pertaining to HPC for this highly influential document.
- See *www.science.org.au/supporting-science/science-sector-analysis/reports-and-publications/decadal-plan-australian*

AUSTRALIAN NATIONAL INSTITUTE FOR THEORETICAL ASTROPHYSICS STEERING COMMITTEE   2010-2013

- Cultivated linkage between the Australian observational and theoretical astronomy communities. Twice elected.
- See *anita.edu.au*, for more information

MAJOR INTERNATIONAL RESEARCH PROGRAMS

DARK-AGES, REIONIZATION & GALAXY-FORMATION OBSERVABLES NUMERICAL SIMULATION (DRAGONS)

- Lead simulator for this comprehensive simulation program designed to accurately represent the growth of galaxies and cosmic reionization during the early history of the Universe.
- See *dragons.ph.unimelb.edu.au*, for more information.

THE WIGGLEZ DARK ENERGY SURVEY

- Lead theorist for this survey mapping the positions of 240,000 galaxies to detect and measure subtle ripples is the distribution of galaxies, imprinted by small acoustic oscillations in the early-Universe's matter distribution.
- See *wigglez.swin.edu.au*, for more information

List of publications available on request, or from www.astronomy.swin.edu.au/~gpoole

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