

How CSIRO is thinking about addressing the 3rd Space



**John Zic, Executive Manager
Scientific Computing Services
and
Janet Esposito, Innovation and
Digital Learning Stream Lead**



(Digital)(Re)Enablement of Research and Science

“... US and UK that are driving forward programmes of work to **accelerate** and **transform** the ways in which science is undertaken, with a strong remit to create new forms of science.

At the heart of the vision lies **collaborative scientific production** supported by advanced forms of technology.

Initially these programmes of work were almost entirely focussed on technical solutions to difficult complex science problems. In the last few years increasingly, socio-technical researchers have begun to investigate the types of activities that need to occur in order to turn the vision into a reality.

This work often suggests ways in which the vision needs to be recalibrated in the light of a more detailed understanding of the sociality of work.”

Jirotko, M.; Lee, C.P.; Olson, G.;
*Supporting Scientific Collaboration:
Methods, Tools and Concepts,*
Computer Supported Cooperative
Work © Springer Science+Business
Media Dordrecht 2013
DOI 10.1007/s10606-012-9184-0



Challenges and Digital Transformation

CSIRO's purpose is clear:

Solving the greatest challenges through innovative science and technology



We do this today through:

- ✓ World-class scientific research
- ✓ Mobilising and developing the best talent, for the benefit of Australia
- ✓ Managing research infrastructure on behalf of the nation

The Challenges & Digital Transformation Program is about accelerating our work to solve these challenges through four distinct, but interdependent streams of work

The Challenges accelerants

Missions

- Opportunity to increase our impact by working at scale and broadening our collaboration
- Give us room for fewer, bigger things. Stimulate collaboration and R&D investment
- Contribute to the goal by 2020 to have 1-3 Missions launched and by end of 2025 for Missions to make up more than 1/3 of science impact Business Unit's total expenditure

Future Science & Technology (S&T) Plan

- Clarity of CSIRO's role in the science system and our future focus on emerging science and technology
- Guidance for making science investment decisions for your area

Digital Academy

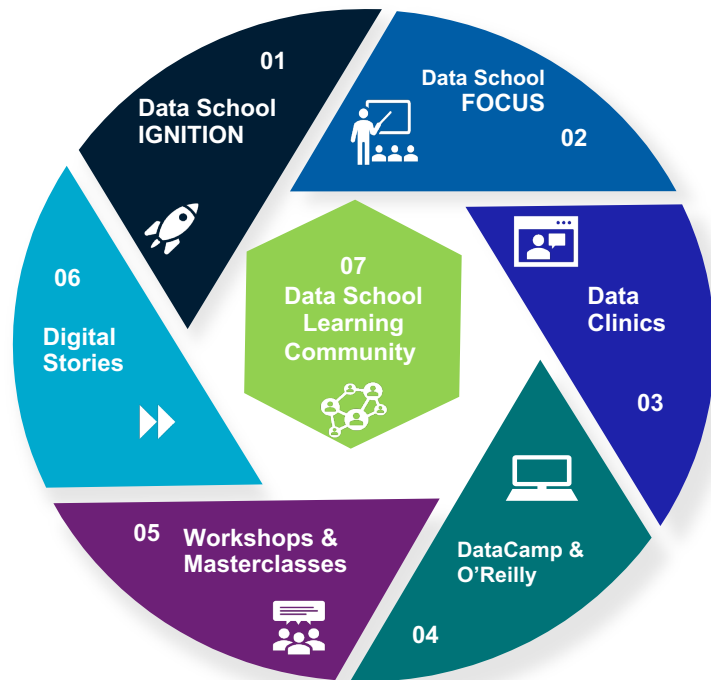
- The opportunity to invest in the digital capability of our people and rethink planning for a digitally-driven science world
- Attract and retain new digital talent within the national innovation system
- Develop new digital skills and mindsets in our science areas
- Facilitate digital talent accessibility and collaboration across our national innovation system

Managed Data Ecosystem

- The opportunity to know what data you have and its value. Who has access to it, how it's being used and whether it is being managed according to CSIRO's requirements
- That you have the tools to fully realise the value of your data



Current Digital Academy Learning Offerings



IMT SCIENTIFIC COMPUTING SERVICES



CSIRO Research Projects

Digital Science Consultancy

Planning & Provisioning;
Analytics;
Concierge;
Science domain computing and data expertise

Astronomy; Bioinformatics;
Chemistry; Earth Sciences;
Synchrotron Science;

Embedding Expertise

Driven by requirements from research projects and strategic initiatives

Drawing on our expert teams

Data Analytics and Visualisation
Research Software Engineering
Technical Solutions
Modelling and Dataflow

Capability Development

Digital Learning

Python; Using CSIRO HPC; ML,
AI and Data Analytics;
Software Engineering

Outreach

Conferences - C3DIS 2020
Student and Internships
Technical Leaders
Drop-in expert sessions

Service delivery and partnerships

Scientific Software License management

Scientific Software services

Partnership advisor and liaison

Research Data

**High Performance Compute
and Data Platforms**

Partner Facilities



IMT Scientific Computing Services Expertise

Data analytics and visualisation

- Complex scientific visualisations
- Data analytics
- Machine Learning, Deep Learning and Artificial Intelligence

Workflows - data & compute centric

- Batch job management
- Dependency based methods
- Streaming (data ingest, robust pipelines)
- Workflow tools

High performance scientific applications

- Algorithm and Program Optimisation
- Parallelisation/partitioning
- Power optimisation for large scale computations
- Pipeline optimisations

Simulation and modelling

- Computational Fluid Dynamics;
- Finite Element Analysis
- Complex systems



~40 Staff



11 PhD

Specialised web development

- for science and data analytics

Research software engineering

- Verification, Testing and Validation
- Agile methodology
- DevOps
- Requirements analysis

Domain specific algorithms and software

- Astronomy
- Bioinformatics
- Remote sensing
- Image and Signal Processing

Science data management

- Provenance
- Lifecycle management
- Data formats and interchange

Solution design

- Cloud
- HPC based
- Storage
- Governance frameworks, reporting





Where do I go for more information?

Contact details:

John Zic

john.zic@csiro.au

02 9490 5682, and

Janet Esposito

janet.Esposito@csiro.au

02 9490 8128

csiro.au

- **[Solving-the-greatest-challenges](#)**