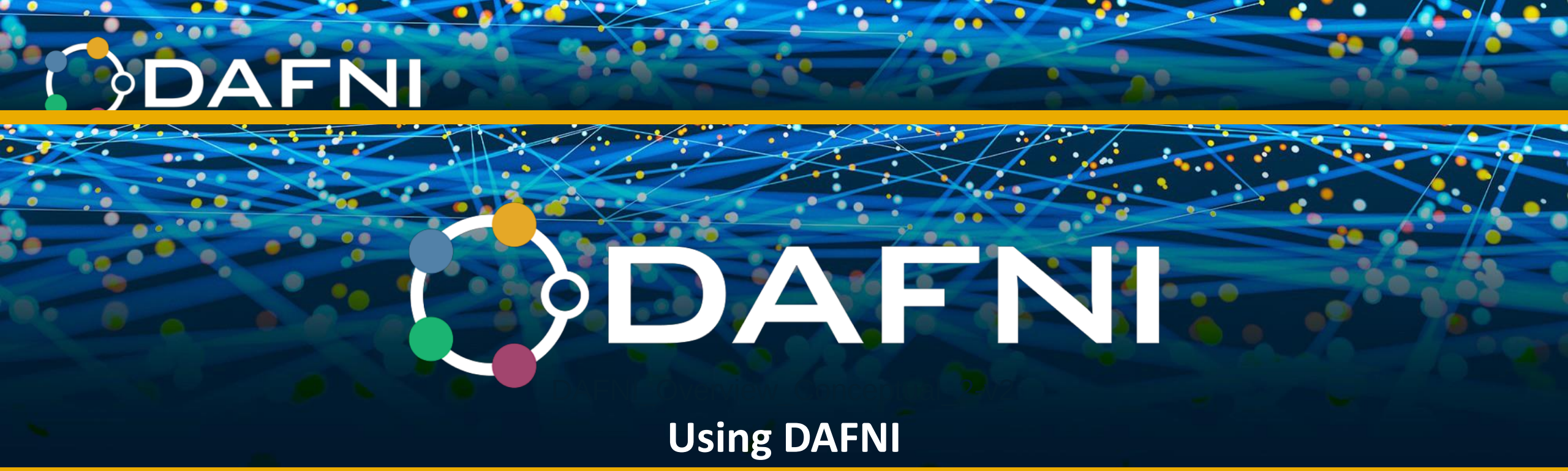

Using DAFNI

Dr Brian Matthews
DAFNI Project Lead, Scientific Computing Department,
Science and Technology Facilities Council

Science and Technology Facilities Council

Engineering and Physical Sciences Research Council

UKCRIC

EPSRC Engineering and Physical Sciences Research Council

Science & Technology Facilities Council

UK Research and Innovation

UKCRIC

Where is DAFNI Now ?

- DAFNI Phase 1: 2017-21: 4 year development programme
  - Requirements gathering, design, implementation
  - Now in an intense development phase
- University hardware: £950,000 of investment into the 12 universities.
- Getting pilot users onto the platform
  - Pilot programme
  - Champions programme
- Outreach programme
  - Webinars
  - Hackathons – particularly with the Urban Observatory programme
  - Final event – July 2021

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DAFNI: A HTC Hardware Platform

- DAFNI provides a dedicated HTC cluster
    - 27 server nodes
        - 792 CPUs, 16.8TB RAM, 10×Nvidia V100 GPUs (paired)
    - 2PB storage total:
        - Including 127 TB of “fast” storage (e.g for databases)
        - 20TB very high-throughput SSD/Flash storage pool
- Maintained in the STFC Machine Room at RAL
- Set up as a Kubernetes Cluster
- Can give more computing power to applications
    - faster
    - scale up

Champions Programme

- Champions Programme established
  - Funded by DAFNI
  - pilots, requirements, promotion
  - 5 Champions' Projects funded

- University of Southampton: Simon Blainey, Adrian Hickford
  - Opportunities in the Transport Research Community
- UCL: Mike Batty, Juste Raimbault
  - MATSim (Multi-agent Transport Simulation) framework
- Cranfield University: Simon Jude
  - Integration of DAFNI and UKCRIC Urban Observatories
- Sheffield University: Daniel Coca, Cristian Genes
  - DAFNI as a Digital Twin Platform

- UCL : Liz Varga, Andrey Postnikov, Lauren McMillan; Oxford: Tom Russell; Newcastle: Luke Smith; Cranfield: Stephen Hallett, Ian Truckell
  - Infrastructure Research Ontology

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Sustaining DAFNI

- Developing our sustainability plan: DAFNI Phase 2
  - Long-term sustainability for production beyond September 2021
  - Seeking to establish a hybrid model: platform support and contributions from projects.

- A production platform
  - Setting up a service management environment
  - Operating the platform
  - User support, operations, help desk

- Looking towards Phase 2:
  - Digital Twins: running long-running models with real-time input and outputs
  - Support for Machine Learning models
  - Richer data infrastructure
  - An extended framework for integrating models.

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Working with Partners

- Working with a wide range of partners

… in academia
  - The DAFNI consortium – 12 leading universities
  - And beyond: Reading, UEA, Liverpool, Heriott-Watt …
  - EPSRC, NERC, STFC

… in government
  - NIC, ONS, OS, BEIS
  - Environment Agency, CCC, DEFRA, Bank of England

… in industry
  - Mott-MacDonald, Costain, Arup, Water Companies …

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DAFNI within a Research Programme

DAFNI plays a role within the lifecycle of research

- Explore the subject
  - Access and explore other data sources and models
- Prepare data
  - Organise and share data resources with a distributed research team
  - Access controlled to collaborators
- Develop new techniques
  - Build, deploy and scale-up models
  - Combine and couple models together into workflows
  - Visualise results
- Publish results
  - Release data, models and visualisations
  - Allow others to explore the models
- Curation of results
  - Keep results on DAFNI for future reuse
  - A legacy for research projects

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DAFNI is Open for Business!!!

- If you have a suitable pilot within the current programme:
  - Discuss with Steve, Simon
  - Discuss with the DAFNI Team: Marion Samler, Brian Matthews
- We can provide logins to try it out
- For future projects
  - If you feel that DAFNI could play a suitable role in your project then consider including DAFNI in your proposal
  - Eligible for research grants
- We are developing a cost model
  - Platform hosting and operations costs, resource usage
  - RSE time
    - Help on developing and integrating the models and data, optimising to the platform
    - Changes and feature develop on the DAFNI platform
- Please talk to us! info@dafni.ac.uk

DAFNI

Thank You

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