The DiRAC-4 process*

*as currently understood!

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DiRAC
High Performance Computing Facility

DiRAC-4

- DiRAC-3 was installed in 2021
  - With a 2023 extension
- DiRAC-4 planning is ongoing
- Peer-reviewed science case has been completed
- User community has been engaged
- Technical case is being worked on
- Aiming for completion before April*

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Community engagement

- Two face-to-face meetings
  - December and March last year
- Online calls with project Pis
- Follow up on discussions
- Code porting exercises and studies
- Please do keep engaging
  - If you feel your science has been overlooked, let us know!

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Requirements specification

- Categorisation of different workflows
  - FLOPs requirements
  - Memory requirements
  - Network connectivity requirements
  - Storage requirements
    - I/O rates
- From Science case and community meetings

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Translation to systems

- One system meeting all requirements would be expensive
  - Multiple systems work out cheaper
- Broad requirements point to:
  - High FLOPs GPU system
    - With good network connectivity
    - ~25x Tursa to meet science case (250PF)
  - High RAM system with high storage
    - ~5x COSMA8 ~3PB RAM
  - Mixed workload CPU system with moderate GPU
    - ~100k cores

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Net-Zero

- HPC is a large energy user
- DiRAC is taking steps towards Net-Zero
  - However we primarily rely on the decarbonisation of electricity (2030?)
  - And bespoke design to optimise science outputs: smallest system that achieves science goals!
- ~£1m solar panel installation
- Energy efficient cooling (PUE<1.2)
- Energy monitoring and reporting (user emails)
- Active energy reduction (server settings, clock speeds)
- RSE work: Code optimisation
- Adaptive power reduction studies at peak CO2 periods
- Award of kWhr rather than CPUhr for some projects

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Embodied CO2

- CO2 produced in manufacture is huge
  - Can be a large fraction of the system lifetime emissions
  - We should aim to run our systems for longer
    - And get more science from them
- Hope for something beyond green-washing in the DiRAC-4 procurements
  - Carbon budgets and accounting are here (within UKRI)

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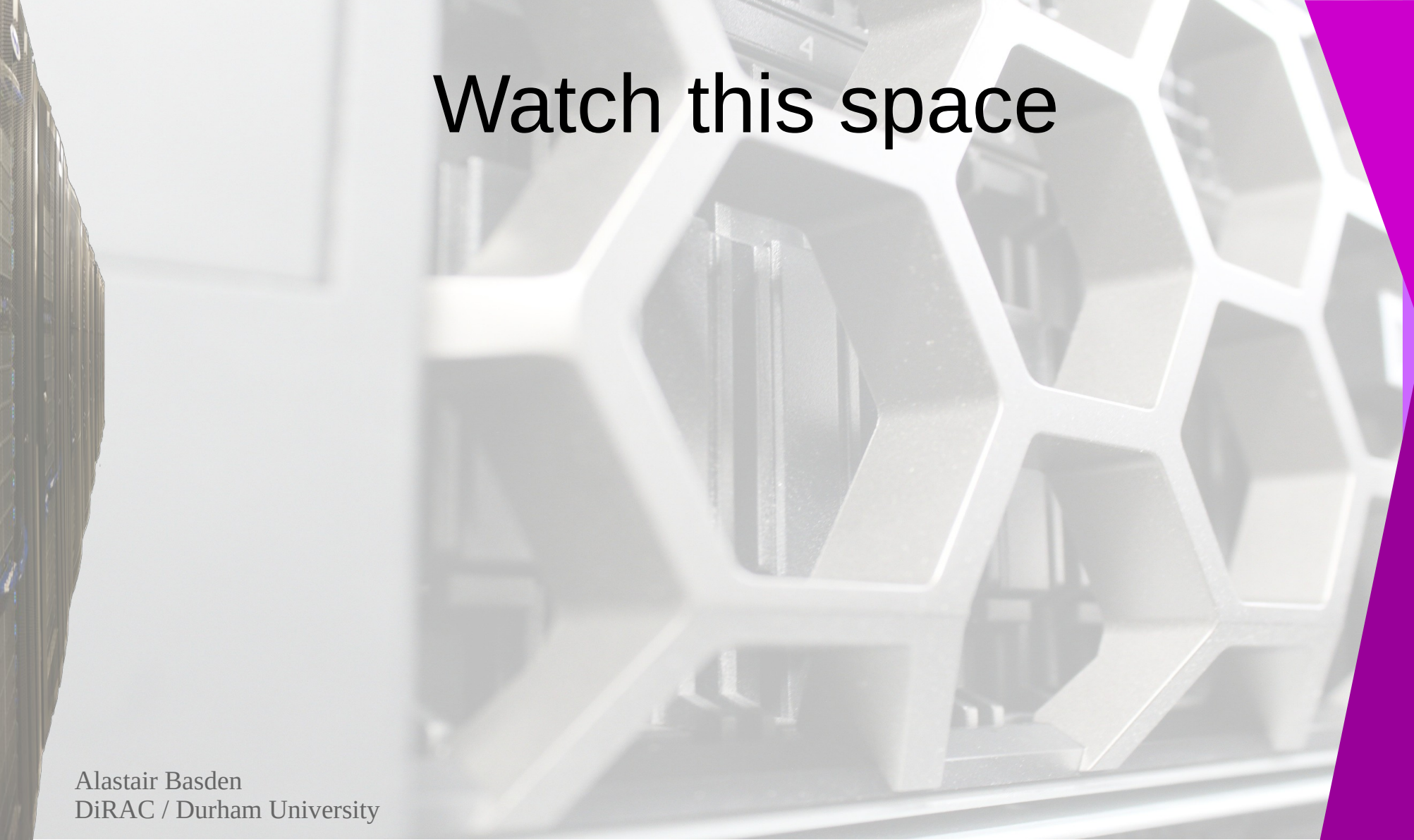
What next?

- Await funding for DiRAC-4:
  - DiRAC-3 was 5 years ago: new system now overdue
- With a design accounting for:
  - Science requirements
  - Net-zero
  - Diverse hardware architectures
- In the meantime:
  - We can give assistance/advice getting codes running on other systems (and with data transfer etc)
    - AIRR/NCR/EuroHPC

Watch this space



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