PRACE

Partnership for Advanced Computing in Europe

HPC Training Perspectives and Collaborations
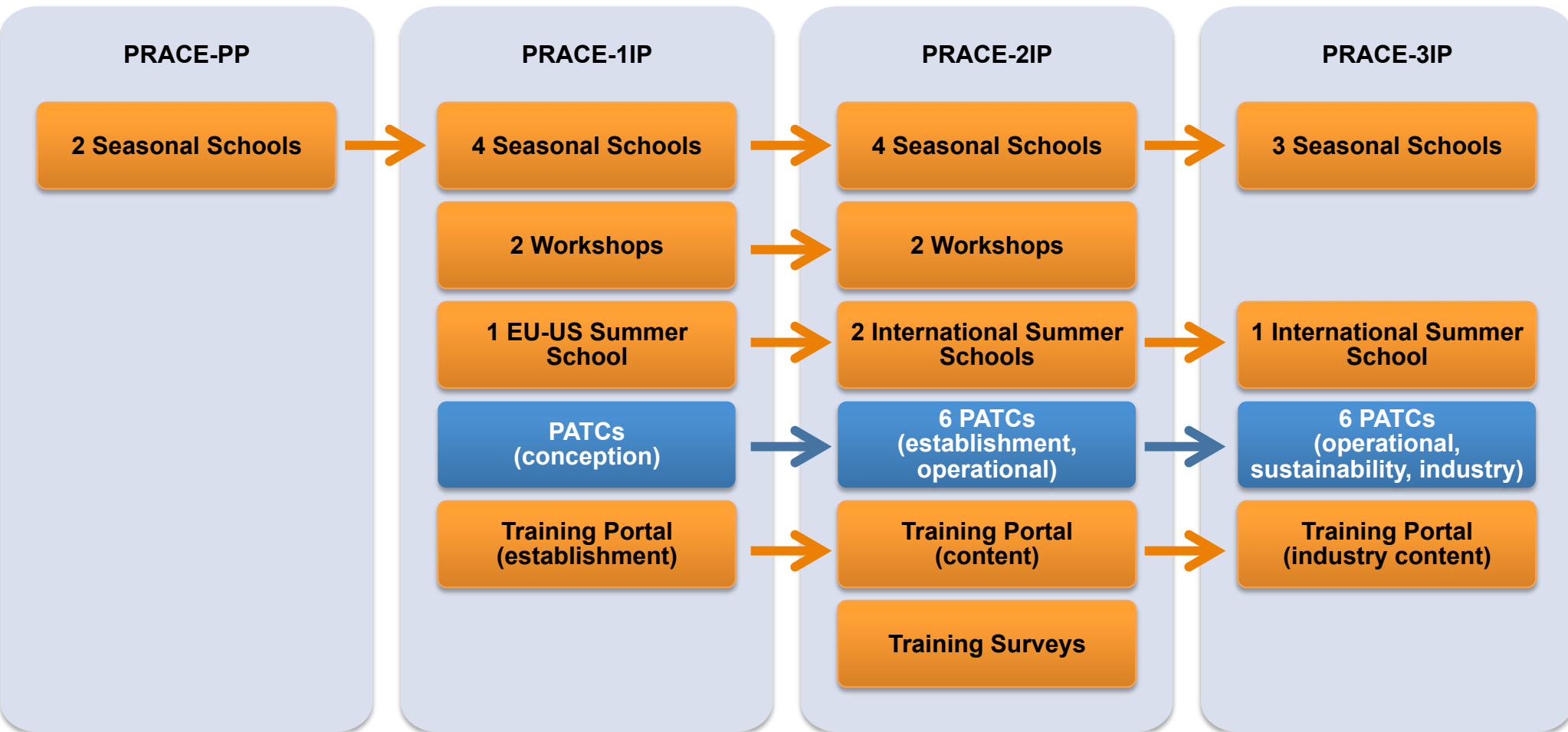
PRACE Advanced Training Centres

In the context of overall PRACE training...

PRACE-PP	PRACE-1IP	PRACE-2IP	PRACE-3IP
2 Seasonal Schools	4 Seasonal Schools	4 Seasonal Schools	3 Seasonal Schools
	2 Workshops	2 Workshops	
	1 EU-US Summer School	2 International Summer Schools	1 International Summer School
	PATCs (conception)	6 PATCs (establishment, operational)	6 PATCs (operational, sustainability, industry)
	Training Portal (establishment)	Training Portal (content)	Training Portal (industry content)
		Training Surveys	

In the context of overall PRACE training...

PRACE-PP	PRACE-1IP	PRACE-2IP	PRACE-3IP
2 Seasonal Schools	4 Seasonal Schools	4 Seasonal Schools	3 Seasonal Schools
	2 Workshops	2 Workshops	
	1 EU-US Summer School	2 International Summer Schools	1 International Summer School
	PATCs (conception)	6 PATCs (establishment, operational)	6 PATCs (operational, sustainability, industry)
		Training Surveys	

PATCs have been operational since March 2012

PRACE Advanced Training Centres

6 PRACE Advanced Training Centres (PATCs): Hubs for world-class HPC training for researchers in Europe.


D4.2

- Barcelona Supercomputing Center (Spain)
  – **Maria-Ribera Sancho** (director)
  – Nia Alexandrov (coordinator)
- CINECA - Consorzio Interuniversitario (Italy)
  – **Nico Sanna** (director)
  – Francesco Falciano (coordinator)
- CSC - IT Center for Science Ltd (Finland)
  – **Martti Louhivuori** (director)
  – Minna Hahl (coordinator)
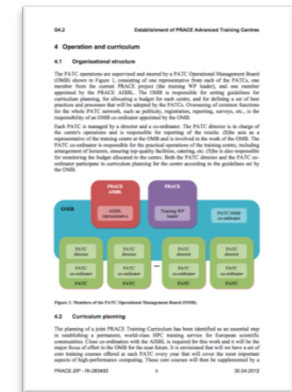
PRACE Advanced Training Centres

- EPCC at the University of Edinburgh (UK)
  - **David Henty** (director)
  - Irina Nazarova (coordinator)

- Gauss Centre for Supercomputing (Germany)
  - **Rolf Rabenseifner** (director)
  - Sabine Höfler-Thierfeldt (coordinator)

- Maison de la Simulation (France)
  - **Edouard Audit** (director)
  - Michel Kern (coordinator)
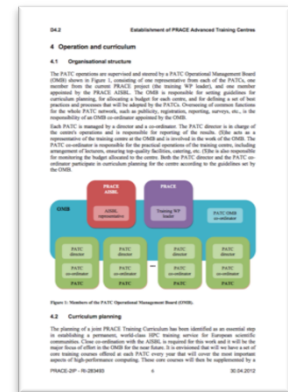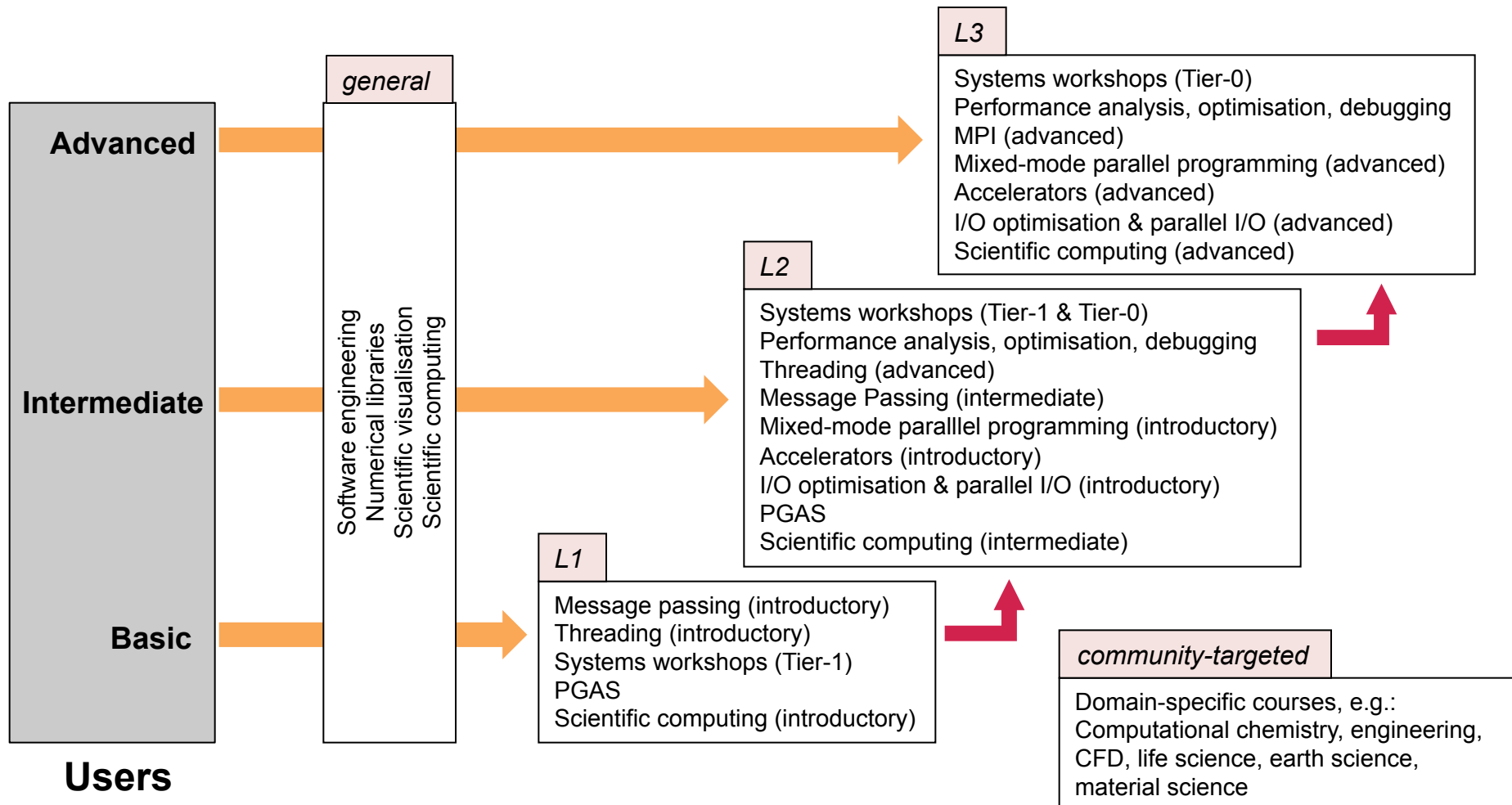

D4.2

Definitions

Syllabus

 list of subject areas, or individual courses here
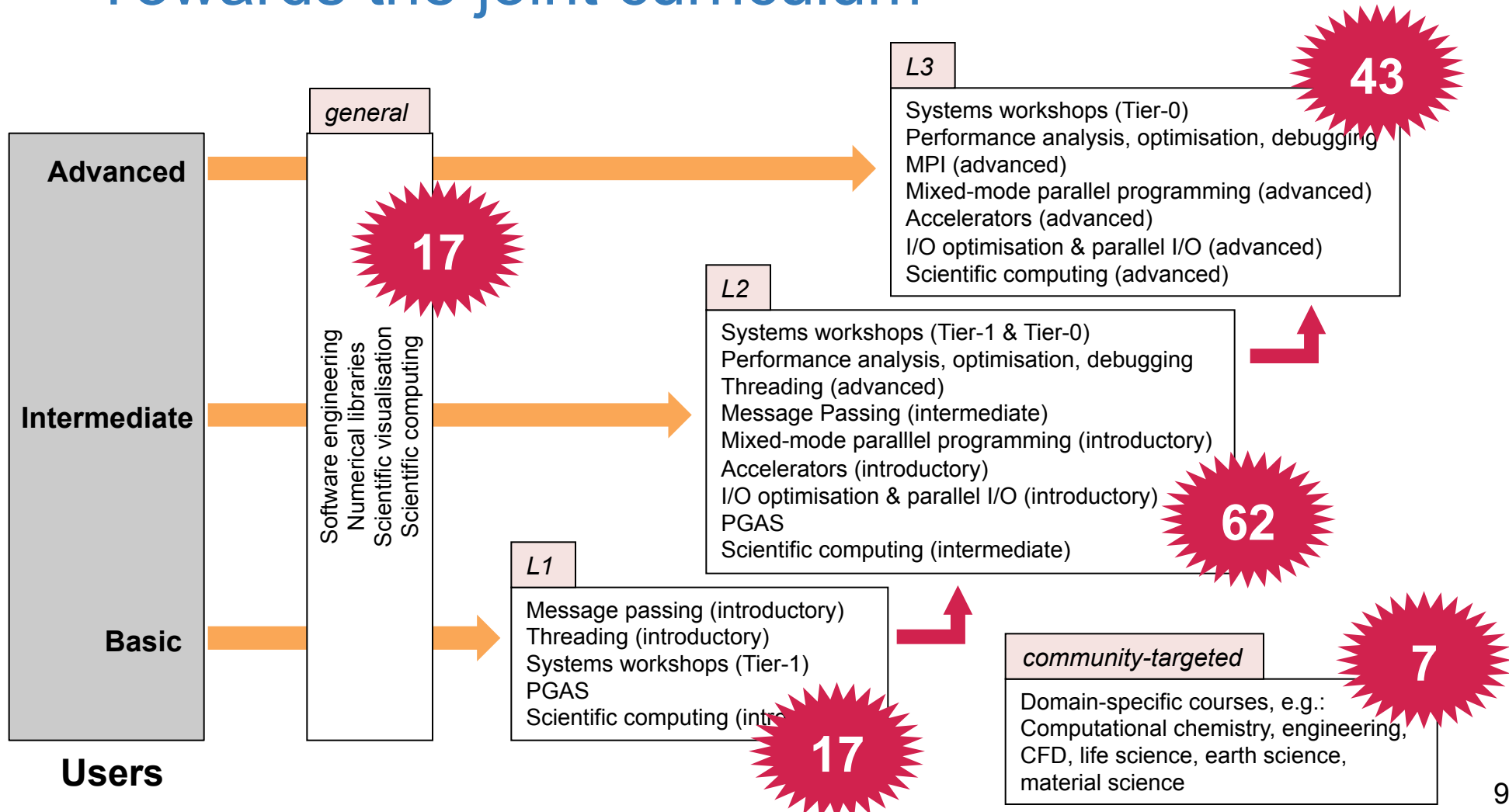
Curriculum

 an aggregate of courses; "prescribed learning paths"

Target a **joint** PATC curriculum that caters for researchers with varying levels of HPC experience, along with domain-specific and industry-oriented courses.

Towards the joint curriculum

Advanced

Intermediate

Basic

Users

general

Software engineering
Numerical libraries
Scientific visualisation
Scientific computing

L3

Systems workshops (Tier-0)
Performance analysis, optimisation, debugging
MPI (advanced)
Mixed-mode parallel programming (advanced)
Accelerators (advanced)
I/O optimisation & parallel I/O (advanced)
Scientific computing (advanced)

L2

Systems workshops (Tier-1 & Tier-0)
Performance analysis, optimisation, debugging
Threading (advanced)
Message Passing (intermediate)
Mixed-mode paralllel programming (introductory)
Accelerators (introductory)
I/O optimisation & parallel I/O (introductory)
PGAS
Scientific computing (intermediate)

L1

Message passing (introductory)
Threading (introductory)
Systems workshops (Tier-1)
PGAS
Scientific computing (introductory)

community-targeted

Domain-specific courses, e.g.:
Computational chemistry, engineering,
CFD, life science, earth science,
material science

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Towards the joint curriculum

Users

Advanced

Intermediate

Basic

general

Software engineering
Numerical libraries
Scientific visualisation
Scientific computing

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L1

Message passing (introductory)
Threading (introductory)
Systems workshops (Tier-1)
PGAS
Scientific computing (intro

17

L2

Systems workshops (Tier-1 & Tier-0)
Performance analysis, optimisation, debugging
Threading (advanced)
Message Passing (intermediate)
Mixed-mode paralllel programming (introductory)
Accelerators (introductory)
I/O optimisation & parallel I/O (introductory)
PGAS
Scientific computing (intermediate)

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L3

Systems workshops (Tier-0)
Performance analysis, optimisation, debugging
MPI (advanced)
Mixed-mode parallel programming (advanced)
Accelerators (advanced)
I/O optimisation & parallel I/O (advanced)
Scientific computing (advanced)

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community-targeted

Domain-specific courses, e.g.:
Computational chemistry, engineering,
CFD, life science, earth science,
material science

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Summary of work so far

- Have run 90 PATC training courses
- 2,000 attendees from all over Europe (and beyond)
- Taken together the joint curriculum covers:
  - key subjects of importance
  - different target audience (HPC experience), including focus on intermediate and advanced users
- Course material (slides, videos etc.) centrally collated

Coherent information, registration and evaluation
`www.training.prace-ri.eu`

Success Story: Mar 2012 – July 2013

90 courses

260 days of training

6417 participant-days

8.5 / 10
- Average overall course rating, from 1037 feedback forms from 77 courses

Other HPC training

- **National**
  - e.g. ARCHER training (from EPCC), 72 days p.a. around UK
  - EPSRC-funded HPC Autumn Academy (Cambridge)

- **Postgraduate Taught**
  - EPCC's MSc in High Performance Computing
  - New MSc in HPC with Data Science

- **Within other programmes**
  - recently funded CDTs, upcoming European Training Networks
  - relatively modest funding available here

Challenges

- Trainee mobility
- Training the trainers
- Sustainability
- Industrial involvement
- Scope: only "Advanced" courses?
- Scope: training beyond the main curriculum?