

# Proposal for a Center of Excellence for computing applications

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# Call for proposal for Centers of Excellence on HPC

- within framework Horizon2020/ pillar excellent science / e-infrastructures

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2143-einfra-5-2015.html>

- published 11/12/2013 - deadline 14/01/2015
- expected 8-10 CoEs across EU, with expected budget 4-5ME each
- duration 2 years, but there will be a follows up call.

# Key aspects of the call

## CoE expected to be:

1. user-driven, with the application users and owners playing a decisive role in governance (complementary to computing centers);
2. integrated: include not only SW but also HW, data management/storage, connectivity, security...; multidisciplinary: expertise including HPC system, software, algorithm, ...;
3. distributed (with a possible central hub).

## Proposals should address:

- ★ Provision of services such as: *developing, optimizing, re-design* application codes for peta/exascale; *testing, maintaining* codes; *co-design* of hardware, software; *consultancy* to industry and SMEs; *addressing the skills gap* in computational science.
- ★ Working in synergy with European HPC infrastructure, incl. *co-design* of HPC technologies towards exascale.
- ★ Sustainability: embracing *wide range of service models* and *funding from a mixture of sources, sponsorship by industry or hybrid public-private*. *Clear business plans* are expected in the proposal.
- ★ Creating communities around specific codes that impact the target sectors, involving SW vendors, where appropriate, and exchange of best practices in particular for SMEs.
- ★ Management: *commercial management expertise* will be needed along with *technical expertise* to manage *industry clients* and supply chains, in addition to *users from academia*.

## Expected impact:

Excellent science, competitive industry in Europe...

# Proposal from Edinburgh

<http://higgs.ph.ed.ac.uk/workshops/european-centre-excellence-physics-extreme-scales>

**Scope:** “Centre of Excellence in Physics at Extreme Scales”

This allows inclusion of any domain of physics with challenging computing requirements

**Idea:** “algorithms and implementations, hardware and software, data generation and exploration must evolve together in order efficiently to solve the most challenging physics problems, and that this co-design plays a key role in driving new computing technologies for mass markets.”

**Activities:**

(not necessarily  
assigned to  
different people)

WP1. Community software development and data management

WP2. New algorithms for large-scale simulation and data analytics

WP3. Languages and programming models for heterogeneous architectures

WP4. Energy-efficient processor, memory and interconnect architectures

WP5. High speed data streaming, real-time analysis and data ingest

WP6. Emerging and disruptive technologies

WP7. Dissemination and training

**Partners:** Industry: the Call expects participation by some of the companies in the ETP4HPC

Academia: see scope (it will be important to understand which other consortia are being formed).

*Track record in co-design is the strongest card in this proposal.*

**Organization/Business model:** distributed hub; co-lead of WP by physicists/computer scientist, academia/industry. Research institutions provide space and facilities; Companies pay modest annual subscription.

**Next step:** meeting in Edinburgh on April 15.

## ...some more comments

In my opinion, this CoE is a great opportunity to give continuity and take advantage of a long tradition of INFN activities.

The proposal from Edinburgh is an excellent starting point, but many important details need to be defined, and the meeting on the 15/4 will be very important for that.

E.g., we should be more precise about which **services** can the CoE provide to SMEs:

1. Skilled students in the usage of HPC;
2. Collect systematically the state of the art about how to use each one of the main *applications*.  
on each main *architecture*.
3. Workshops / Schools

These are very valuable services, but why/how should SMEs pay for them? *Modest* fees won't probably ensure the *sustainable business model* requested by the Call.

However, research is best payed with *reputation*: academia and industry can both gain enormously by advertising — among their communities — their successful collaborations, of which we have already a great record. This will translate into private/public fundings for specific projects.