Human Brain Project

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How to get access to HPC and data resources

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How to get access to HPC & data resources?

General principle

- Large-scale systems (computing, storage…) are publicly funded (national and/or EU funding) for the national/European research communities and/or for dedicated projects/communities
- Systems operation, maintenance, user support etc. are also publicly funded (institutional funding and through national/EU projects)
- Eligible scientists get allocations for free, i.e. without having to pay for the usage.
- Industry projects, if supported, usually need to pay for the usage.

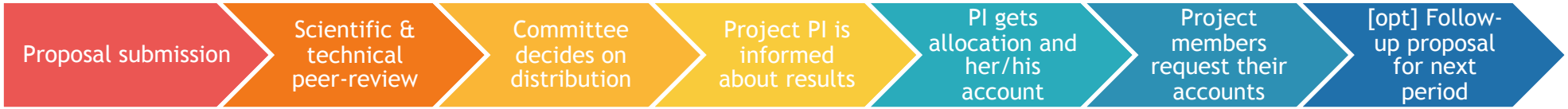
Ensuring a fair distribution of resources

- Large-scale systems are precious and limited resources.
- Allocation process usually builds on peer-review to ensure the “best possible” and fairest distribution:
  - (Independent) scientific peer-review assesses the scientific excellence of the proposals.
  - Technical peer-review (usually by experts of the hosting site) assesses the technical feasibility and efficiency of software and workflows, i.e. if the project can make “reasonable use” of the system.

How to get access to HPC & data resources?

Application process

Calls with submission deadlines or “rolling calls”, e.g. with monthly cut-off dates.



Allocations are granted

- for a fixed amount of time (e.g. monthly quota with a total project duration of 1 year), or
- as fixed contingent that is available until fully used or until a certain end date,

depending on the type of resource and setup of the call.

Call and allocation types (HPC resources)

There are different types of calls and allocations for HPC resources for different purposes:

- Project access / regular calls
  - Large(r)-scale, production-level projects
  - No or only limited software development or optimisations included in project plan
- Preparatory access / development projects
  - For optimising, scaling and testing code before applying to regular calls
  - Development projects: for development of new software and libraries
  - Preparatory access: often complemented by support from technical experts
- Test projects
  - For preparing the scaling data required for an application to a regular call

Which calls are available?

- Fenix
  - For HBP members
  - For non-HBP members
- PRACE calls
  - Project access
  - Preparatory access
- National calls

Fenix Infrastructure

- Distinguishing characteristic as compared to other infrastructures:
  - Data storage and scalable computing resources in close proximity to each other and tightly integrated
- Deliver federated compute and data services to European researchers
- Service-oriented provisioning of resources, aiming to
  - Meet the requirements of various science communities
  - Form a basis for the development and operation of community-specific platform tools and services
    - E.g. enabling data sharing or simulations with Arbor or NEST

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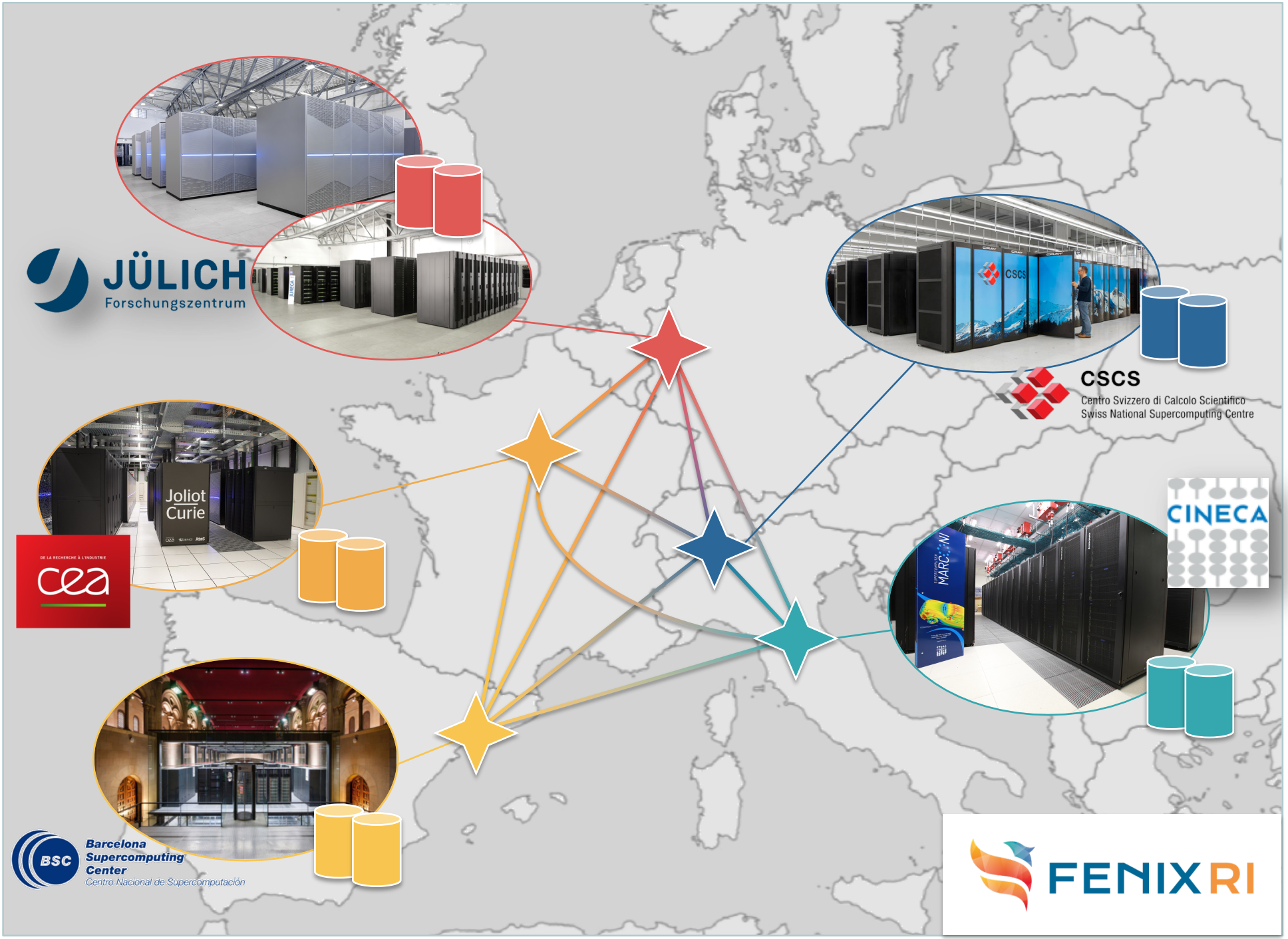
JÜLICH
Forschungszentrum
CSCS
Centro Svizzero di Calcolo Scientifico
Swiss National Supercomputing Centre
Joliot Curie
cea
CINECA
BSC
Barcelona Supercomputing Center
Centro Nacional de Supercomputación
FENIX RI

Fenix Infrastructure – Available Services

FENIX RESEARCH INFRASTRUCTURE

Scalable Computing Services (SCC)

- Massively parallel HPC systems suitable for highly parallel brain simulations or for high-throughput data analysis tasks

Interactive Computing Services (IAC)

- Quick access to single compute servers to analyse & visualise data interactively, or connect to running simulations using SCC

Virtual Machine (VM) Services

- Service for deploying VMs in a stable and controlled environment, e.g. platform services like the HBP Collaboratory

Active Data Repositories (ACD)

- Site-local data repositories for storing temporary slave replicas of large data sets

Archival Data Repositories (ARD)

- Federated data store for long-term storage and sharing of large data sets

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Access to the Fenix Infrastructure

- Access via **HBP** (25% of the resources are reserved for HBP)
  - PI of the project applying for resources has to be an **HBP member**
  - In the future also access for **Partnering Projects** of the HBP
- Access via **PRACE** (Partnership for Advanced Computing in Europe)
  - **Non-HBP members** can apply for access via PRACE, directly or as part of a proposal to a PRACE Tier-0 Project Access Call
- **Allocation Mechanism** for resources of the Fenix Infrastructure
  - Process follows peer review principles established by PRACE
  - Each **user community** (e.g. HBP) is responsible for the actual distribution of their share within that community

Access to the Fenix Infrastructure

- Allocation mechanism for HBP members
  - Point of contact is the ICEI Project Management Office: icei-coord@fz-juelich.de
  - Resource request form to be send to ICEI PMO
  - ICEI PMO coordinates the review process and is available for questions from applicants and informs them about the final decision
- For applications asking for a small amount of resources, there is the possibility of a shortened procedure without peer review
  - If you would like to get a small-scale allocation for application porting and performance testing, resources are usually granted within 3-4 weeks
  - Such requests are useful for getting access for testing
- The **resource request form** and further information are available in the **Fenix/ICEI Collab:**
  https://collab.humanbrainproject.eu/#/collab/28520/nav/200129

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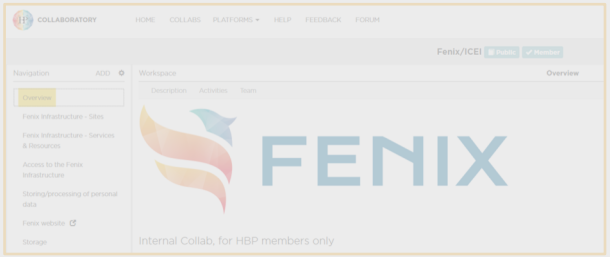
→ Session „How to apply for computing and data resources“, Wednesday, 14:00-15:30



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Partnership for Advanced Computing in Europe

- PRACE is an international not-for-profit association (aisbl) with 26 member countries.
- The PRACE Research Infrastructure provides access to distributed persistent pan-European world class HPC computing and data management resources and services.
- PRACE systems are available to scientists and researchers from academia and industry from around the world through Project and Preparatory Access.
- http://www.prace-ri.eu

PRACE Tier-0 systems (Nov. 2019)

- Hazel Hen
  - Höchstleistungsrechenzentrum Stuttgart (HLRS), Germany
- JOLIOT Curie
  - Très Grand Centre de Calcul (TGCC) operated by CEA, France
- JUWELS
  - Jülich Supercomputing Centre (JSC), Germany
- MARCONI
  - CINECA, Italy
- MareNostrum 4
  - Barcelona Supercomputing Centre (BSC), Spain
- Piz Daint
  - Swiss National Supercomputing Centre (CSCS), Switzerland
- SuperMUC
  - Leibniz Supercomputing Centre, Garching, Germany

PRACE Project Access

- For individual researchers and research groups including multi-national research groups
- 1-year production projects, but also 2-year or 3-year production projects (Multi-Year Access)
  - Multi-year projects get allocations awarded for one year at a time, with provisional allocations for the 2nd and 3rd year
- Special track for industry access
- 2 Calls per year:
  - Usually open in March and September and close after about one month
  - Allocation periods (examples):
    - Call #20, opening in September 2019:
      Allocation period: 1 April 2020 – 31 March 2021
    - Call #21, opening in March 2020:
      Allocation period: 1 October 2020 – 30 September 2021

About 6 months between call closing date and begin of allocation period

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PRACE Preparatory Access

- Objective: allow PRACE users to optimise, scale and test codes on PRACE Tier-0 systems before applying to PRACE calls for Project Access.
  - Production runs are not allowed as part of PRACE Preparatory Access.

Type	Purpose	Max. project duration	Maximum amount of support by PRACE experts
Type A	Produce scalability plots of the performance of the codes on PRACE HPC systems	2 months	*No support*
Type B	Development and optimisation	6 months	*No support*
Type C	PRACE experts provide support for adaptations (development and optimisation) to the user's codes	6 months	Equivalent of 6 person-months of effort
Type D	Start code adaptation or optimisation on a Tier-1 system, with access to Tier-0 system towards the end of the project for scalability tests	12 months	Equivalent of 6 person-months of effort

Application procedure

- Calls are announced on PRACE website, Twitter and a dedicated mailing list
- Project Access: application is only possible when a call is open
- Preparatory Access: “rolling call” with continuous submission and regular cut-off dates
- Application process:
  - Applicant completes an online form
    - Highly recommended: read Guide for Applicants
    - Select up to 3 scientific fields that define the research activities (relevant for evaluation process)
    - Optional: propose up to 3 reviewers for your proposal (but making sure to avoid conflicts of interest)
  - Evaluation by scientific reviewers and PRACE experts
  - Assignment of positively evaluated projects to systems

National calls for computing time proposals

- The national calls for computing time proposals follow the same or similar principles as PRACE and Fenix (peer-reviewed proposals, regular calls etc.).
- All systems available through PRACE (and in some cases Fenix) calls are also available through national calls.
- Some systems, e.g. JURECA at Jülich Supercomputing Centre, are only available through national calls.
  - If a system is available through PRACE and/or national calls and/or Fenix depends on how it was funded, if it is a Tier-0/1/2 system…
- Some sites/national calls offer special allocation types in addition to regular project access, e.g.
  - CSCS: Development projects
  - JSC: Preparatory access with support by experts from the Simulation Labs (similar to PRACE Prep. Access Types C and D but experts also have domain expertise)

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National calls for computing time proposals

Eligibility criteria

- In general: PIs being citizen of the country that offers resources or whose affiliation is in this country can apply.
  - Co-PIs or collaborators from other countries are often allowed.
- Brief summary:
  - JSC (NIC calls): Will consider applications from “foreign” PIs to a certain extent. They will be subject to the transparent scientific peer review under the John von Neumann Institute for Computing (NIC).
  - CSCS: Resources are open to all scientists, irrespective of their nationality, provided the projects comply with US Export Control.
  - BSC (RES calls): Recommended but not mandatory to have a Spanish collaborator in the project.
  - CINECA (ISCRA calls): Open to PIs affiliated to an Italian institution
  - CEA (DARI calls): Open to French public research institutes or French industrial companies (with a requirement to publish the obtained results)
- More details: https://hbp-hpc-platform.fz-juelich.de/?page_id=68

User support

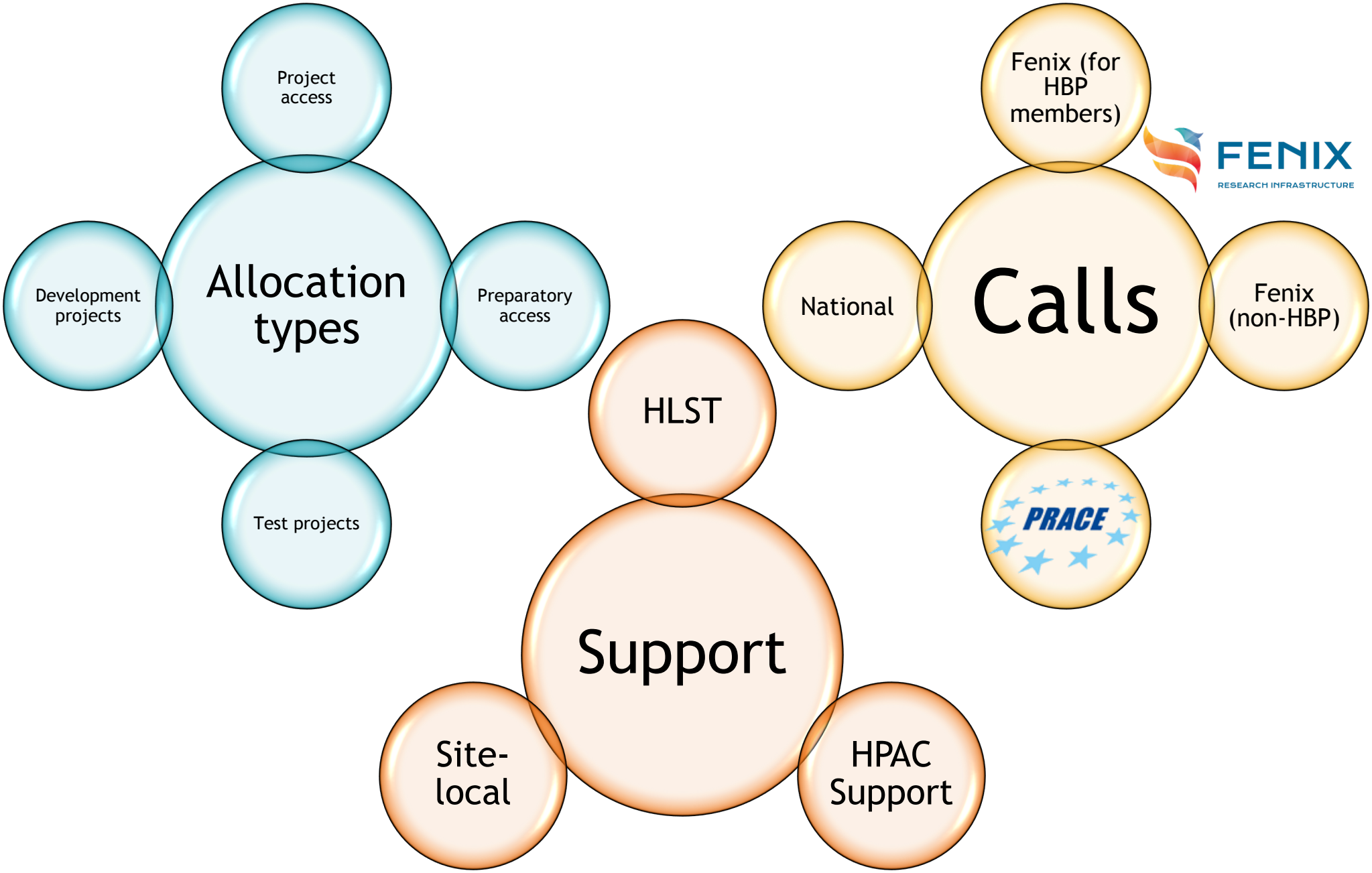
- User support is offered at different levels, directly by the supercomputing centres, through projects (like HBP and ICEI/Fenix), PRACE…
  - Site-local support teams: answer “easy questions” directly or route them to local system administrators or experts
  - Project-specific support teams (e.g. HPAC support team): help to solve project-specific issues, e.g. with domain-specific applications, tools and libraries; can be contacted directly or receive tickets from the site-local support teams or HLSTs
  - High-Level Support Teams (HBP or PRACE): more advanced support, work with users on their projects and issues; also forward tickets to the other support teams as applicable

User support

Whom should I contact in which case?

- First & best point of contact: support@humanbrainproject.eu
  - Will open a ticket in the central HBP ticket system.
  - Ticket will be assigned to the corresponding HLST, which may forward it to another support team/level, e.g. the HPAC support team or the NEST developers.
- Question specific to a call for resource access: point of contact for this call
  - ICEI/Fenix: icei-coord@fz-juelich.de

The HBP support helps both, HBP members and external users in the same way.



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What‘s best for my project?

- Some of the systems are available through multiple different calls
  - E.g. Piz Daint resources (CSCS) are available through Fenix, PRACE and national calls

Some rules of thumb

- Check first if Fenix offers are what you need
  - 25% of the resources are assigned to HBP and not fully allocated and used yet, even more resources will become available in 2020
  - The application process is comparably light-weight
- If you need a large-scale HPC allocation: PRACE
- If you need a smaller HPC allocation: national calls

- If in doubt: contact our support ☺

Where and when can I learn more?

- Other sessions during this training course ☺
  - How to apply for computing and data resources, Alex Upton (Wed, 14:00-15:30)
- Flyers about access to Fenix resources (general and for HBP users)
- Our websites (see below)
- “Massive Computing” booth at the HBP Open Day 2020
- Dedicated Fenix sessions at the HBP Summit 2020

support@humanbrainproject.eu

https://hbp-hpc-platform.fz-juelich.de

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