

ChEESE

Center of Excellence for Exascale in Solid Earth (second phase)

5th PSB meeting

On-line
5th June 2024

Arnau Folch
Geociencias Barcelona (GEO3BCN-CSIC)



Project funded by EuroHPC under the grant agreement No 101093038.



Agenda

14:50-15:00 Conection of participants

15:00-15:05 **Meeting introduction and rules**
A. Folch (CSIC, coordinator)

15:05-15:25 **Overall project status at M18**
A. Folch (CSIC, coordinator)

15:25-15:40 **1st project review results**
Discussion on recommendations

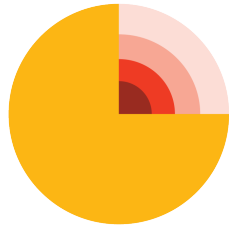
15:40-15:50 **Agenda and logistics of the 2nd General Assembly in Iceland**
M.J. Garcia (CSIC), B. Halldorsson (IMO)

15:50-16:50 **Progress and next steps for each WP**
WPLs, 8-10 min each

16:50-17:00 **Questions and AoB**
Open discussion

17:00 Meeting closure





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**Center of Excellence for Exascale
in Solid Earth (second phase)**

Meeting introduction and rules

Arnau Folch
Geociencias Barcelona (GEO3BCN-CSIC)



Project funded by EuroHPC under the grant agreement No 101093038.



PSB voting rules

From the ChEESE-2P Consortium Agreement (CA), section 6.2:

- The **Project Supervisory Board** (PSB) is chaired by the PC and involves 1 representative from each of the 17 partners (i.e. 18 PSB members in total)
- A minimum of 2/3 nominate (or deputy) delegates must be present at PSB meetings for voting actions (i.e. 12 people)
- One vote per delegate to make strategic decisions during the PSB meetings
- If no consensus can be reached, decisions will be approved by a simple majority of members

5th PSB meeting: no items with vote today.

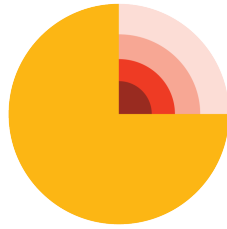


5th PSB: list of delegates

No	Partner	Delegate
1	CSIC, Coordinator	A. Folch
2	CSIC	M.J. García (deputy)
3	BSC	M. Monterrubio
4	INGV	A. Costa
5	IMO	B. Halldórson
6	HLRS	J. Gracia
7	CIN	P. Lanucara
8	TUM	M. Bader
9	LMU	A.-A. Gabriel

No	Partner	Delegate
10	UMA	J. Macías
11	NGI	F. Lovholt
12	CNRS	N. Favretto-Cristini (deputy)
13	EVIDEN	E. Raffin
14	CSC	J. Heikonen
15	RBI	C. Denamiel
16	UM	A. Popov (deputy)
17	SU	L. le Pourhiet
18	E4	M. Rosati





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Overall project status at M18

Contributions from all WP leaders



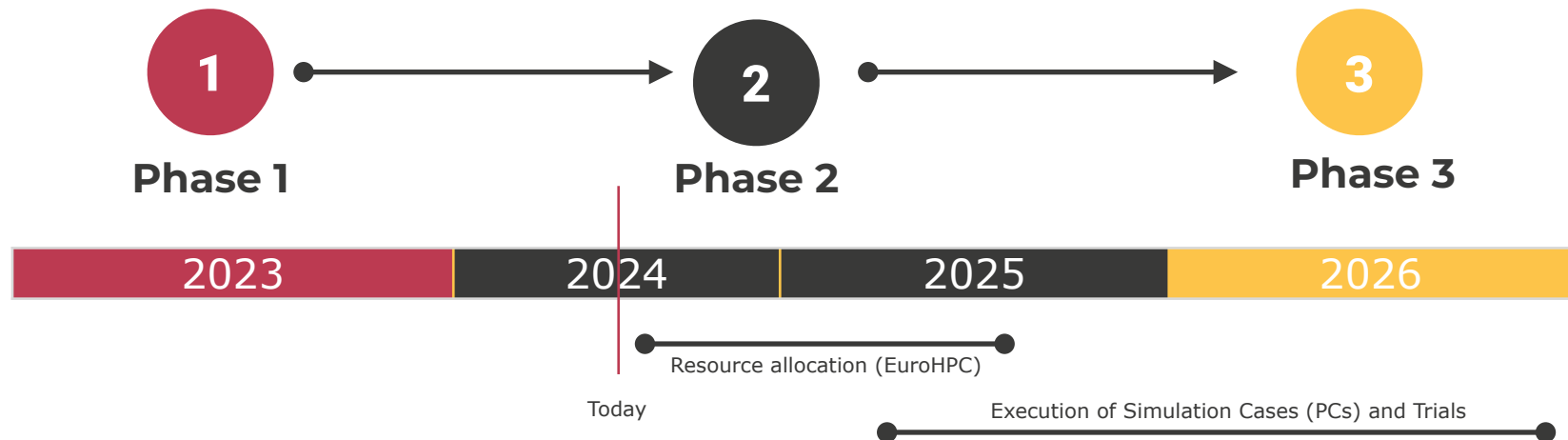
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7 Work Packages

WP	WP Title	Lead Partner	Start Month	End Month	Person Months	Tasks	Deliverables
1	Project Management	CSIC	1	48	78	5	5
2	Exascale technical challenges in flagship codes	CIN	1	48	247	4	4
3	Co-design with European HPC vendors and technologies	BA	6	42	86	3	2
4	Simulation ecosystem	HLRS	1	48	95	3	5
5	Farming Pilot Demonstrators	CNRS	1	42	235.5	2	10
6	Simulation cases and service enabling using EuroHPC infrastructures	INGV	13	48	165	4	13
7	Dissemination, outreach and community building	BSC	1	48	70.5	6	8
	TOTAL				976	27	47

ChEESE-2P: Implementation phases



- Project setup and overall planning.
- First code audit campaign.
- Collection of mini-apps.

- Increase the performance portability across different NVIDIA/AMD GPUs.
- New functionalities (physics, couplings) in the codes
- Setup of the Simulation Cases and trials
- Provision of computational resources through EuroHPC regular and extreme access modes.
- Execute the first production runs.

- Final deployment of the PDs.
- Enable UC services on EuroHPC
- Perform user-driven evaluation trials and exercises (in collaboration with IUBs).



Deliverables (10/47)

Deliverable		WP	Deliverable name	Lead	Type	Month	Date	Status
1	1.1	1	Project Management and Quality Guidelines	CSIC	R	2	Feb 2023	sub.
2	7.1	7	Project website	CSIC	DEC	2	Feb 2023	sub.
3	7.2	7	Communication and Dissemination Plan	CSIC	R	3	Mar 2023	sub.
4	1.2	1	First Data Management Plan (DMP)	CSIC	DMP	6	Jun 2023	sub.
5	7.3	7	Collaboration plan with complementary projects	CSIC	R	6	Jun 2023	sub.
6	7.4	7	Training Plan	BSC	R	8	Aug 2023	sub.
7	2.1	2	First code audit report	HLRS	R	12	Dec 2023	sub.
8	3.1	3	Selected set of mini-apps and its requirements	CIN	R	12	Dec 2023	sub.
9	4.1	4	Initial report on workflow setups and auditing	HLRS	R	18	Jun 2024	pending
10	6.1	6	Simulation Cases and Trials definition	INGV	R	18	Jun 2024	pending
11	4.2	4	Plan for deployment tool for WFs and SW	CIN	R	20	Aug 2024	pending
12	2.2	2	First report on code performance at exascale	CIN	R	24	Dec 2024	pending
13	5.1	5	New version release of flagship codes	TUM	DEC	24	Dec 2024	pending

M18



Project milestones

MS	Milestone name	Month	Lead	Means of verification (KPI)
MS9	Complementary Grants	6	CSIC	CASTIEL-2 collaboration agreement (COLA) has been signed
MS1	Project setup phase	8	CSIC	D1.1, D1.2, D7.1, D7.2, D7.3
MS10	Application deployment	12	HLRS	Codes available to users of EuroHPC via automated deployment, documentation, testing and quality checks
MS2	Preparation of mini-apps	18	CIN	Effective co-design with EuroHPC Pilots can start (D3.1)
MS3	Flagship code functionalities	24	CNRS	Code version releases with the new functionalities (physics) available repository (D5.1)
MS4	Mid-term review meeting	25 (21)	CSIC	Check of the project program development (D1.3)
MS5	Exascale code preparation	36	CIN	Improvements in the flagship codes performance metrics after the second code audit round (D2.2, D2.3)
MS6	Exascale pilot deployment	42	CNRS	PDs tested successfully (D4.4, D5.2 to D5.10)
MS7	Production runs	48	INGV	SCs executed, EOSC-enabled datasets produced (D6.x)
MS8	Community building	48	BSC	UC services enabled, evaluation exercises (trials) with IUB members done, effective liaison with ecosystem initiatives, training completed

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Messages and updates (1): CASTIEL2 and EuroCC

Code of the month	FALL3D and OpenPDAC participated in the code of the month vol.8 (29 May 2024)
dos and donts	3rd workshop: Interaction with public administration (27 May 2024)
Application thematic clusters (CoEs-NCCs)	Clusters are focussed groups to share expertise internally and reach out to external stakeholders. Clusters will start with " HPC simulation to address environmental risks " (3 CoEs: ChEESE, ESiWACE, HiDALGO, and 5 NCCs; from Czech Republic, France, Sweden, Turkey, Austria)
EuroHPC strategic access mode for CoEs	This access mode will NOT be considered: "the EuroHPC JU is currently unable to award resources to these initiatives under the Strategic Access mode" (D. Opalka)
Technical collaboration	Inter-CoE collaboration on technical aspects of code development and porting (CASTIEL is collecting questionnaire)
CASTIEL2 Information Sharing System (C2ISS)	Call for potential success stories from ChEESE to be published on the EuroCC ACCESS website (https://www.hpccoe.eu/success-stories)
CI/CD on EuroHPC systems	Little progress here; we need to agree on how to proceed! (joint effort T4.3 and T7.6)



Messages and updates (2): CI/CD

EuroHPC

- Imposed a very top-down (and probably unrealistic) approach; even after the GA signatures.
- No specific resources assigned to the task.

CoEs side

- CoEs can hardly assign additional efforts to the CASTIEL2 activities, especially the CI/CD one.
- Each CoE (or even each code) follows a different internal approach to CI/CD.
- Hosting entities are very heterogeneous regarding CI/CD facilities and underlying technical challenges (e.g. authentication, external access, security, etc).

CASTIEL side

- CASTIEL D5.8 (CI/CD platform) was rejected; they were asked for a detailed roadmap for the CI/CD.
- CASTIEL is working on a CI/CD implementation roadmap for 2024/2025 (although the dedicated CI/CD project is supposed to start in 2025), and asked for latest information from each CoE about progress concerning CI/CD:
 - URL: <https://edocs.hlr.de/nextcloud/s/GBnmID9pacgg5n>
 - Password: weirD-satisfy-admonish-2023



Messages and updates (3): co-design with mini-apps

mini-apps (7)

mini-SeisSol

mini-SPECFEM3D

mini-FALL3D

mini-Tandem

mini-xSHELLS

mini-HySEA

mini-pTatin3D

Kick-off of Phase 1 of the **EUPEX Early Access Programme** (EAP)

- EUPEX opens its target Pilot system to organizations interested in testing their technologies.
- The SiPearl Rhea processor from the European Processor Initiative (EPI) is not ready yet; in the interim the EUPEX EAP gives access to:
 - CEA's Joliot-Curie system with its A64FX partition (80 single-socket A64FX compute node)
 - A selection of the software tools which are planned to be deployed on the EUPEX Pilot



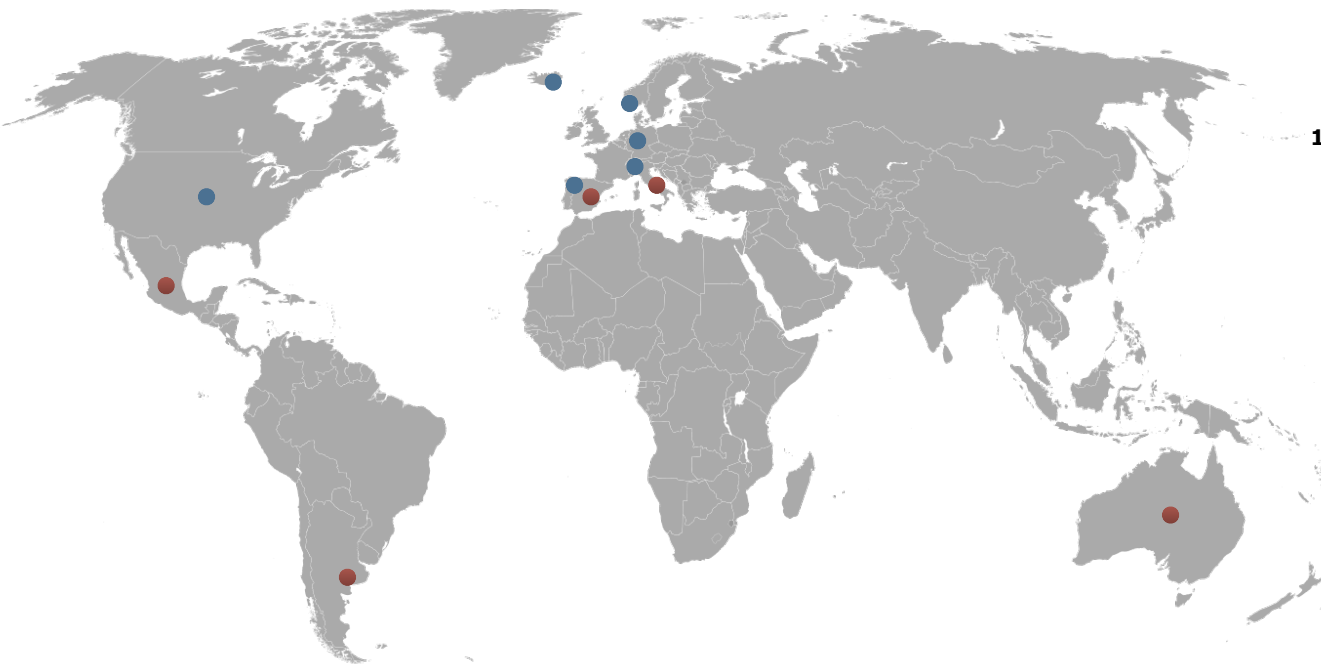
Messages and updates (4): simulation cases and trials

PD	No	SC name	Type	SGC	Expected outcome
PD1	SC1.1	Anthropogenic noise and seismicity, wave propagation at higher frequencies in Rade d'Hyères	capability	yes	open datasets
	SC1.2	Next generation of earthquake simulators for the Hellenic arc and Iceland	capacity	-	earthquake catalogs
	SC1.3	Physics-based PSHA and urgent UQ for Iceland	capacity	-	UC service enabling
PD2	SC2.1	Seismic tomography of the Adriatic-Ionian region	capability	yes	open datasets
PD3	SC3.1	The Global Tsunami Hazard Map	capacity	-	TCS-TSU service in EPOS
PD4	SC4.1	Multi-source local high-resolution scenario with emphasis on the 2022 Tonga case	capability	yes	UC service enabling
PD5	SC5.1	Towards the European tephra hazard map	capacity	-	TCS-VO service in EPOS
	SC5.2	Volcanic dispersal at local scale: a reanalysis of the 2021 La Palma case	capacity	-	UC service enabling
PD6	SC6.1	Urgent high-resolution, 3D multiphase flow simulation of phreatic eruptions at Vulcano	capability	-	UC service enabling
	SC6.2	Long-term probabilistic hazard maps for phreatic eruptions at Vulcano island	capacity	-	open datasets
PD7	SC7.1	MHD turbulence closure models in planetary cores using AI	capacity	-	open datasets
PD8	SC8.1	Magmatic systems and induced landslides: the Etna case	capability	yes	open datasets
	SC8.2	3D evolution of tectonic deformation as driver of seismic hazard in the Hellenic arc	capability	-	open datasets
PD9	SC9.1	Eastern Skaftá cauldron GLOF simulation, Iceland	capacity	-	open datasets
	SC9.2	Calving glacier hazard in Greenland	capacity	-	open datasets



Messages and updates (4): simulation cases and trials

- 1st IUB-ChEESE-2P event (on-line, 30 April 2024)



9 Full members ●

Italian Civil Protection Department (Italy)
Geographic National Institute (Spain)
European Plate Observing System (ERIC)
ARISTOTLE (Italy)
AuScope (Australia)
National Computational Infrastructure (Australia)
National Seismic Institute (Mexico)
Buenos Aires VAAC (Argentina)
Centro PLINIVS (Italy)

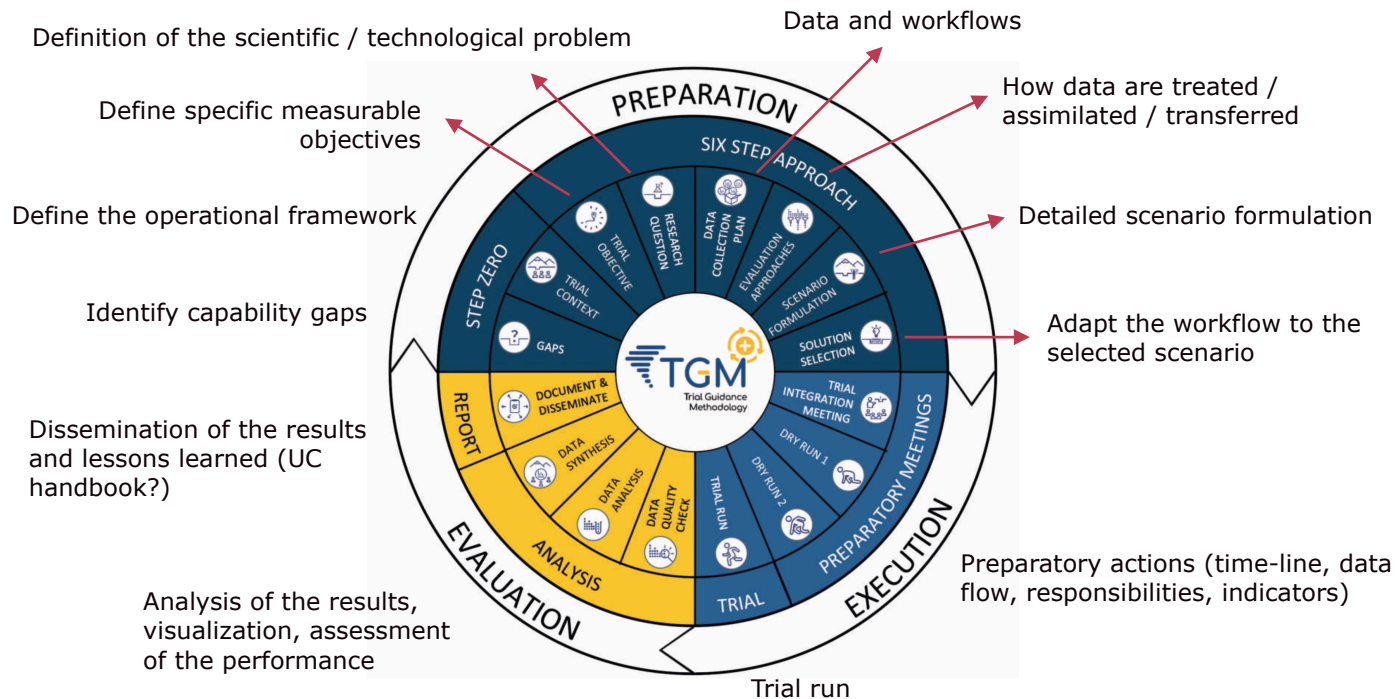
14 Observers ●

Icelandic Civil Protection (Iceland)
IAVCEI
IASPEI
Repsol
Schlumberger
INTEL
Global Parametrics
ARM
FAULT2SHA
Modelling Collaboratory for Subduction (MCS)
Water Resources and Energy Directorate (Norway)
International Center for Earth Simulation (ICES)
NVIDIA
Global Earthquake Modelling Foundation (GEMF)



Messages and updates (4): simulation cases and trials

- WP5 presented a structured methodology for trials involving the users in a co-design process.
- Methodology based on recommendations from the “Driving Innovation in Crisis Management for European Resilience” project (**DRIVER+**; 2014-2022; GA No 607798, EU 7th FP).



TRIAL GUIDANCE METHODOLOGY HANDBOOK

Version 1.1 - February 2020

Messages and updates (5): computational resources

- So far we have/had 1 benchmark and 11 access projects.
- Note that a few codes are still uncovered and that no regular/extreme access applications submitted yet.

Regular access mode

Deadline: 6 Sep 2024

SYSTEM*	SITE (&COUNTRY)	ARCHITECTURE	PARTITION	TOTAL RESOURCES**	MIN (MAX) REQUEST
	BSC (ES)	Lenovo ThinkSystems S0650	MNS GPP	2 775 840	88 000 (228 000)
		Atos BullSequana XH3000	MNS ACC	161 722	32 000 (148 500)
	CINECA (IT)	Atos BullSequana XH2000	Leonardo DCGP	902 368	60 000 (114 000)
			Leonardo Booster	1 023 497	52 000 (220 500)
	CSC (FI)	HPE Cray EX	LUMI-C	894 141	60 000 (114 000)
			LUMI-G	439 319	35 000 (157 500)
	Sofia Tech Park (BG)	Atos BullSequana XH2000	Discoverer CPU	1 560 565	80 000
	LuxProvide (LU)	Atos BullSequana XH2000	Meluxina CPU	729 248	80 000
			Meluxina GPU	184 464	40 000
	IT4I VSB-TUO (CZ)	HPE Apollo 2000 Gen10 Plus x86_64Atos	Karolina CPU	886 500	80 000
		HPE Apollo 6500 Gen10 Plus Nvidia GPGPU	Karolina GPU	65 800	15 000
	IZUM Maribor (SI)	Atos BullSequana XH2000	Vega CPU	1 136 830	80 000
			Vega GPU	53 289	25 000

Extreme-scale access mode

Deadline: 4 Oct 2024

SYSTEM*	SITE (COUNTRY)	ARCHITECTURE	PARTITION	TOTAL RESOURCES**	MINIMUM REQUEST
	BSC (ES)	Lenovo ThinkSystems S0650	MNS GPP	4 626 400	240 000
		Atos BullSequana XH3000	MNS ACC	808 609	165 000
	CINECA (IT)	Atos BullSequana XH2000	Leonardo DCGP	1 503 947	120 000
			Leonardo Booster	3 070 491	245 000
	CSC (FI)	HPE Cray EX	LUMI-C	1 490 234	120 000
			LUMI-G	2 136 594	175 000

From D6.1, we need to group different SCs to apply for joint proposals. Do not miss these calls!

Messages and updates (6): DMP timeline

	M6	M12	M18	M24	M30	M34	M48 end
SQAaaS for code repositories							
Software catalogue (metadata; Zendo)							
Production runs (PDs, SCs)							
Data catalogue (metadata; Zenodo)							
FAIR EVA for datasets							
maDMP							
Other DAs (e.g. deliverables)							
Final DMP (D1.4)						x	

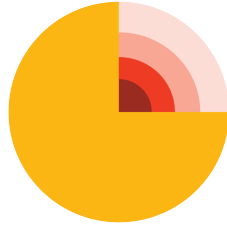
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Messages and updates (7): what's next?

	What	Due Month	Due Date
Reporting	Financial Report (2nd period)	M26	Feb 2025
	Technical Report (2nd period)	M26	Feb 2025
Deliverables	D4.2: Plan for deployment tool for WFs and SW	M20	Aug 2024
Community	Sign complementary grant with CASTIEL-2 (MS9)	M6	June 2023
DevOps	Code version releases with the new functionalities (physics) available repository (D5.1; MS3)	M24	Dec 2024
	CI/CD	M24	Dec 2024
Meetings	2nd GA	M21	Sept 2024





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1st Project Review Results



Project funded by EuroHPC under the grant agreement No 101093038.



Overall assessment

- “The project has fully achieved its objectives and milestones for the period”
- However, **some revisions are necessary** to unlock the payment suspension:

Deliverables	D2.1	Include a table with a summary of the starting point of each code at the beginning of the monitoring period and the advance achieved at the end of that monitoring period
	D7.4	Indicate in the table on page 11 of the deliverable which trainings primarily are under ChEESE control and which are conducted collaboratively with other projects
Technical report	Part B	Minor aspects and resubmit
Financial report	INGV, IMO, CIN, IPGP, SU	A deviation of more than 25% on average personnel costs: justify in Section 5 (underspending deviations)
	BULL	Personnel costs categorised under a2 (unit costs) which is not in line with the DoA Annex 2 a1 (actual costs)



Next actions

- Luxembourg review date: 23 Feb 2024
- Official letter and review report received: 29 May 2024
- Dates:

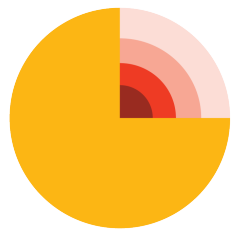
Time	Deadline	Action	Who
15 days after letter	Wed. 12 June 2024	Resubmit Part B	Coordinador
		Financial statements	INGV, IMO, CIN, IPGP, SU, BULL
		D2.1	HLRS / CIN (WP2 leader)
		D7.4	BSC (WP7 leader)
Objections 30 days after letter	29 June 2024		



Report recommendations

No	Comment	Action
1	Activities oriented to achieve pre-exascale should be a priority. WFs should be focused in achieving this objective and not only a mere automatisisation of manual	
2	Improve the reporting of the activities performed in the year of evaluation	To be considered in 2nd technical report
3	Make more efforts in measuring the impact of the project activities	Impact of codes and IUB activities (WP7)
4	All tasks with activities should be informed, not only those that have associated deliverables or that are in an early or preparatory phase	To be considered in 2nd technical report
5	Perform training actions more focused in the use of the selected codes (manuals, videos, etc.)	
6	Establish a close collaboration with POP3 as soon as possible (alternative approaches for measuring code performance need to be considered meantime)	Done, all codes audited by POP
7	Clarify how WFs fit into the exascale ambition of the CoE (efficient data storage, potentially data format standardisation, efficient I/O and others)	
8	Clarify the role of the IUB and who will engage in those tasks related to industry, market assessment or else where this board may not be well prepared to	
9	Collaboration with the twin projects CASTIEL-2 and EuroCC2: (i) CI/CD, (ii) C2ISS (information sharing system platform)	





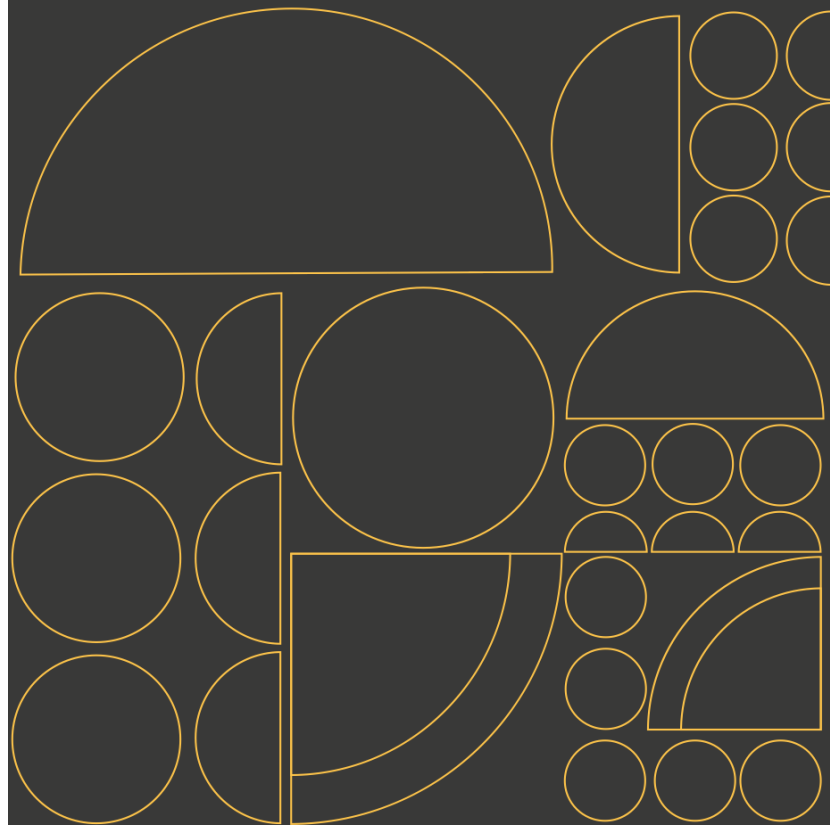
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Next General Assembly Project Management

María José García Miraz
Geociencias Barcelona - CSIC



Project funded by EuroHPC under the grant agreement No 101093038.



Program and attendance:

https://cheese2.eu/wiki/index.php/2024/09/17_2GA



ChEESE GENERAL ASSEMBLY



Icelandic Meteorological
Office, 7, 105 Reykjavik,
Iceland



17 – 19
September 2024

Tuesday 17 September – Meeting Day 1

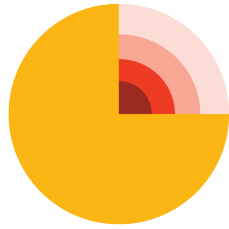
8:00 - 9:00	Meeting facility opens	<u>Bústaðavegur 7, 105 Reykjavík</u> <i>Office building next door to the Icelandic Meteorological Office, and the location of the HPC</i>
9:00-12:30	• Opening of the General Assembly • IMO Welcome • Overview of volcanic unrest in Reykjanes, Iceland	

PROGRAM

Monday Sept 16	DAY 1 Sep 17	DAY2 Sep 18	DAY 3 Sep 19	Friday Sept 20
TRAVEL DAY	Meetings: Full day	Meetings: full day	Full-day field trip to volcanic unrest zone	TRAVEL DAY
	Social Dinner <i>*To be paid individually</i>	Group trip to Sky Lagoon Spa <i>*To be paid individually</i>		

Lunch/Coffee breaks will be provided

- 
- A dark grey vertical bar on the left side of the slide, featuring a series of yellow-outlined geometric shapes including circles, semi-circles, and a quarter-circle, arranged in a pattern that resembles a stylized architectural or abstract design.
- Registration form is already closed, need to inform me directly in case there are any changes
 - Registration for Social dinner/Lagoon Spa and field-trip will be sent shortly
 - IMO does not have any deals with hotels in the area. **Please book in advance!**



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Progress and next steps for each WP



Project funded by EuroHPC under the grant agreement No 101093038.



Task	Task name	LEAD	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Task 1.1	Administrative and financial management	CSIC																
Task 1.2	Operational decision making	CSIC																
Task 1.3	Equality committee	LMU																
Task 1.4	Management of computational resources	CSIC																
Task 1.5	Data management plan and automatic FAIR validation	CSIC																

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WP2

Exascale technical challenges in flagship codes

Task	Task name	LEAD	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Task 2.1	Code audits	HLRS																
Task 2.2	Increasing the performance portability of flagship codes for different accelerators	CIN																
Task 2.3	Optimisation for Exascale	CIN																
Task 2.4	Continuous Performance Efficiency Monitoring	BSC																

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WP3

Co-design with European HPC vendors and technologies

Task	Task name	LEAD	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Task 3.1	Preparation of mini-apps	CIN																
Task 3.2	OpenSequana prototypes (EuPEX)	BA																
Task 3.3	RISC-V prototypes, the European Processor Initiative (EPI) and EuPilot	BSC																

M18



WP4

Simulation ecosystem

Task	Task name	LEAD	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Task 4.1	Workflow implementation and optimization	HLRS																
Task 4.2	Lightweight performance analysis and optimization services for simulation ecosystem components	HLRS																
Task 4.3	Development, deployment and quality assessment tools	CIN/ HLRS																

M18



WP5

Farming Pilot Demonstrators

Task	Task name	LEAD	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Task 5.1	Novel features (physics) in flagship codes	CNRS																
Task 5.2	Developments in Pilot Demonstrators	CNRS																

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WP6

Simulation cases and service enabling using EuroHPC infrastructures

Task	Task name	LEAD	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Task 6.1	Setup of Simulation Cases and trials	INGV																
Task 6.2	Exascale capability simulation cases and Scientific Grand Challenges	CNRS /LMU																
Task 6.3	Exascale capacity simulation cases	INGV																
Task 6.4	EuroHPC urgent computing service enabling	BSC																

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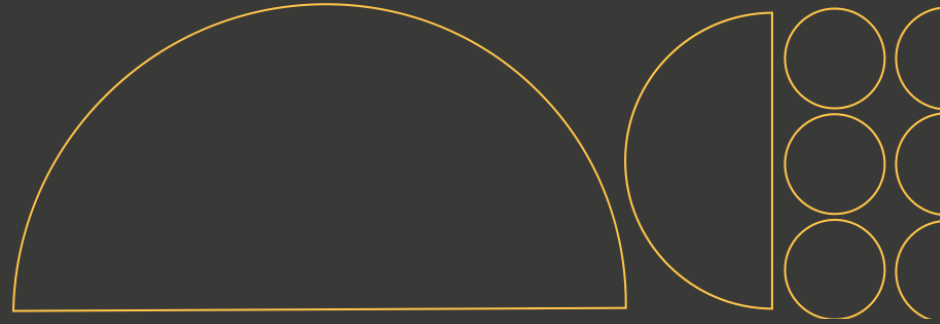


WP7**Dissemination, outreach and community building**

Task	Task name	LEAD	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Task 7.1	Dissemination and communication planning and tools	CSIC																
Task 7.2	Liaison activities	CSIC																
Task 7.3	Training activities	BSC																
Task 7.4	Community building and roadmap activities	BSC																
Task 7.5	Sustainability plan	BSC																
Task 7.6	Collaboration task with complementary projects	CSIC																

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Thank you!



@cheese-coe



<http://cheese2.eu>



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@cheese_coe@techhub.social

