

EURO²

Sezen BOSTAN

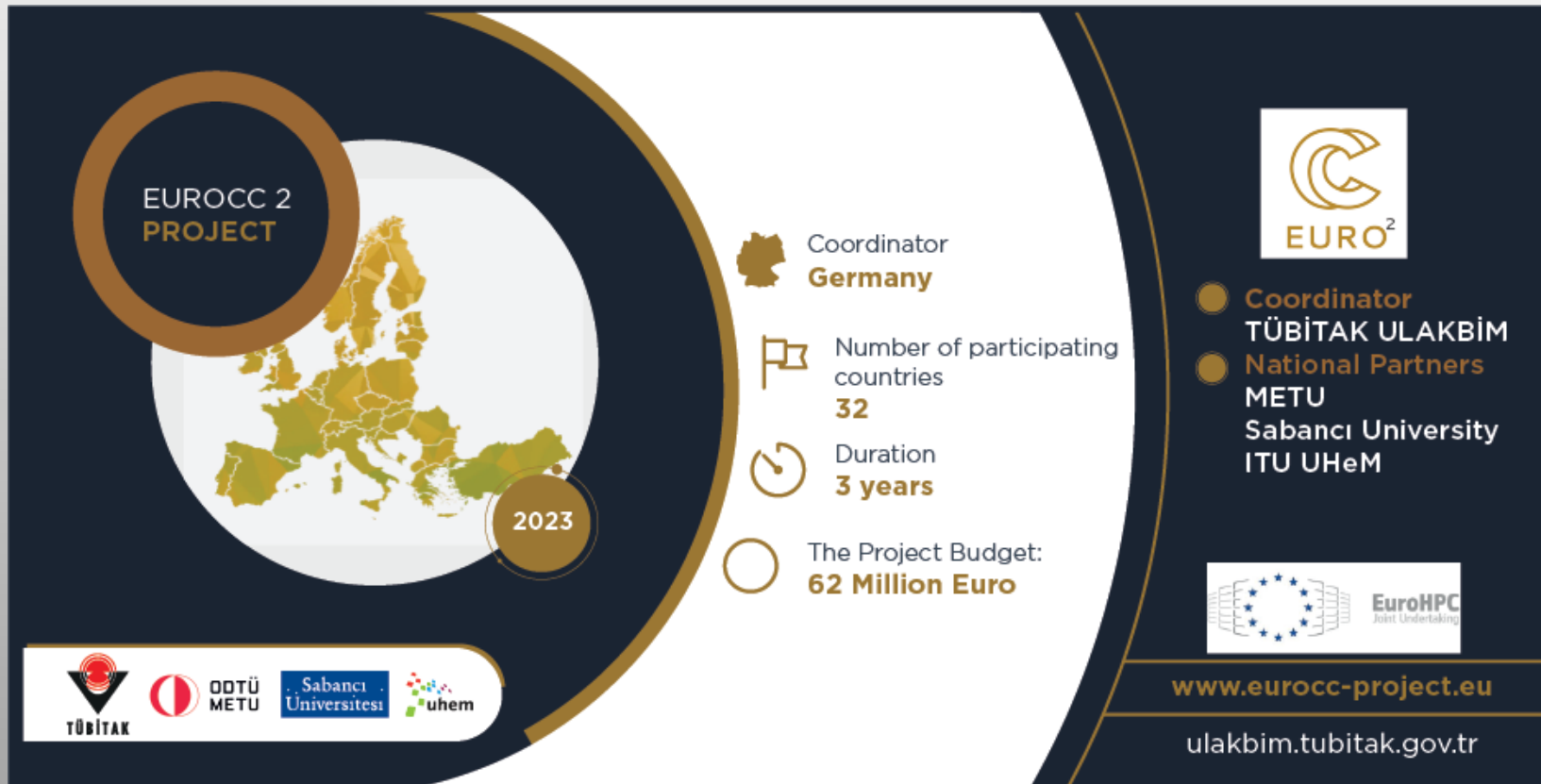
Highlights from NCC Türkiye

October 14-15, 2024

EuroCC PROJECT

High Performance Computing (HPC/YBH), is the use of high-performance supercomputers and parallel processing techniques to solve large-scale and complex computational problems that cannot be solved by laptops or office computers.

EuroCC Project	EuroCC 2 Project
September 1, 2020	January 1, 2023
December 31, 2022	Duration: 3 years



EUROCC 2 PROJECT

2023

Coordinator
Germany

Number of participating countries
32

Duration
3 years

The Project Budget:
62 Million Euro

Coordinator
TÜBİTAK ULAKBİM

National Partners
METU
Sabancı University
ITU UHeM

Logos: TÜBİTAK, ODTÜ METU, Sabancı Üniversitesi, uhem, EuroHPC Joint Undertaking

Website: www.eurocc-project.eu
ulakbim.tubitak.gov.tr

Objective

To increase awareness and competences in the field of **HPC**, **HPDA** and **AI** and to establish National Competence Centers (**NCCs**) in EuroHPC JU participating countries.

CASTIEL 2

CASTIEL 2 promotes interaction and exchange of expertise across the NCC network.

NCC Türkiye Structure



NCC Coordinator

TÜBİTAK ULAKBİM TRUBA
Turkish Science e-Infrastructure

- ✓ Management
- ✓ Infrastructure Support
- ✓ HPC Expertise

Partners

Middle East Technical University
Sabancı University
ITU National Center for High Performance Computing

- ✓ Academic Consultancy
- ✓ Training
- ✓ PoC Mentoring
- ✓ Infrastructure Support



TRUBA – Turkish Science e-Infrastructure



Supporting Organization: Presidency of Strategy and Budget

Resources

- (24.000 + 56.000) CPU cores
- 216 GPUs (P100, V100, A100)+ 96 GPUs (H100)
- 14 PB data storage space

Services

- Resources & Infrastructure support
- Research institutes, public organizations, and private sector
- > 210 National Scientific Research Project support
- > 6400 Registered researchers
- > 400 Researcher using the system at the same time
- > 180 Universities & Institutes & Research Centres

TOP 500 CERTIFICATE
The List.

ARF - ThinkSystem SD650 v3, Xeon Platinum 8480+ 56C 2GHz, Infiniband NDR200

TRUBA, Turkey

is ranked


No. 313

among the World's TOP500 Supercomputers
with 3.00 PFlop/s Linpack Performance


in the 63rd TOP500 List published at the ISC24
Conference on June 01, 2024.

Congratulations from the TOP500 Editors


Erich Strohmaier
NERSC/Berkeley Lab


Jack Dongarra
University of Tennessee


Horst Simon
NERSC/Berkeley Lab


Martin Meuer
Prometheus

NCC Türkiye Activities

9 INFO DAY

4 SME VISITS

8 ACADEMIC VISITS

2 CONFERENCE

NCC TÜRKİYE ACTIVITIES

> 13000 PARTICIPANTS

4 MOOC

39 SEMINAR

29 TRAINING

13 WORKSHOP

Access to EuroHPC Supercomputers

- Extreme Scale Access Mode (2 cut offs/year)
- Regular Access Mode (2 cut offs/year)
- AI and Data Intensive Applications Access Mode (4 cut offs/year)
- Development Access Mode (1st day of each month)
- Benchmark Access Mode (1st day of each month)

Info Days on EuroHPC JU Calls

One –to-one meetings

MOOC Platform on the Stage

MOOC PLATFORM IS NOW OPEN!

@EuroCCTürkiye

Fundamental Concepts of Generative Machine Learning
Molecular Dynamics Simulations of Small Molecules High
Throughput Virtual Screening with the AutoDOCK Vina Program
Molecular Dynamics Simulations with LAMMPS

acikders.ulakbim.gov.tr

PoC Studies

Proof of Concept Studies

- ✓ Free HPC Resources (CPU and GPU)
- ✓ Free Academic Mentorship
- ✓ Free HPC Expertise

EuroCC

29 PoC Studies

Completed	Closed	Success Story
11	8	10

EuroCC 2

7 PoC Studies

In Progress	Success Story
3	4



EuroCC Türkiye Success Stories



EuroCC 2 – Customizing Scene in Virtual Environments using Neural Networks

VLMedia (2014) is a rapidly growing, mobile-focused team reaching millions of smartphone users with social network projects, which are available on AppStore, Google Play, and Web platforms. Their main office is located at ODTÜ Teknokent (Ankara). VLMedia has more than ...

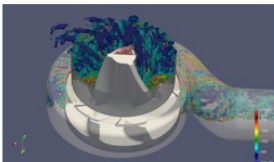
[Read More](#)



Artwise-Nested Named Entity Recognition via Language Model Based Neural Architecture

Founded in 2015, Artwise has been helping companies improve their customer satisfaction by providing actionable insights. By consolidating all customer communication channels in a single platform, Artwise enables companies to understand the sentiment of their customers. Artwise is the first ...

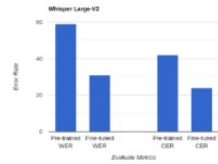
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EYS-High Efficiency Impeller Design for Wastewater Pumps through High Fidelity CFD Simulations

EYS strives to offer practical solutions to organics recycling problems by putting to use their knowledge and experience in manure management, dewatering and composting solutions. The company offers innovative and quality products to shape the future of environmental and agricultural ...

[Read More](#)



EuroCC 2 – Training Large-Scale Models for Speech-to-Text Recognition

Erste (2017), located in Ankara-Türkiye, is a software engineering SME focusing on international R&D projects. It has a wide range of expertise in mobile-device management, predictive maintenance, digital twins, Internet of Things (IoT)-based intelligent port management, smart-software-powered manufacturing environments, blockchain-based ...

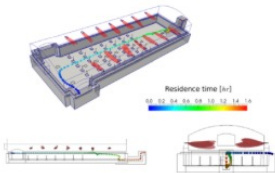
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Parabol-Timetable Optimization in Public Transport

Parabol (paraboly.com) has been conducting R&D activities in Intelligent Transportation Systems since 2011. They have been developing a public transportation (PT) analysis platform (cermoni.app) to analyze public transport (PT) demand in a city and to make more efficient PT investment ...

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Şişecam-Code Modernization for the Glass Industry

As one of the most powerful industrial conglomerates in Turkey, Şişecam is a global player in all key areas of the glass industry. It is internationally renowned for its ever-growing production power, highly reputable brand image, superior product quality, and ...

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FF4EuroHPC Success Stories
SME Innovation Through HPC

Improvement of Graphene-Epoxy Based Composite Materials Production Through HPC

Organizations
Nanograft is a manufacturer and supplier of advanced nanomaterials with one of Europe's largest graphene production plants. All Dynamics is a SME focusing on advanced automotive, aeronautical technologies. Middle East Technical University (METU) is a Turkish public university that provides HPC expertise. TÜBİTAK ULAKBİM is a Turkish national centre providing HPC and data storage to academia and industry.

The Solution
The types and number of functional groups on GO, the mass percentage of GO in the epoxy matrix, and the structure of the epoxy resin were optimized with HPC simulations. The materials were manufactured, tested for material properties and simultaneously modeled by the HPC experts. With classical molecular dynamics simulations, which due to the size of the systems and level of interaction required HPC, strong candidates for the actual synthesis stage have been identified.

The Challenge
Some of the most popular products of Nanograft are nano-sized graphene and graphene oxide (GO)-enhanced polymer composites. Together with All Dynamics, they try to find the optimal composite properties (eg. the dispersion of graphene layers) by an expensive, labor-intensive experiment-based approach which does not always provide the necessary insights. The challenge is to replace this time-consuming and costly process with HPC simulations.

The Impact
Thanks to this experiment, All Dynamics is able to reduce the development time for new high-quality epoxy-graphene nanocomposites materiality up to 50% and the costs by up to 20%. Employing the new HPC workflow, new materials with improved properties can be designed and produced on a large scale with very high accuracy. The companies expect to reduce testing material waste by 70% (approx. 4200,000 savings per year) and raw material consumption by 40% (approx. 820,000 savings per year). The new HPC-based workflow will provide All Dynamics with a competitive advantage and a corresponding increase in revenue, expected to add up to €7,500,000 during the next 3-4 years. Nanograft will be able to sell significantly more raw graphene products to customers, especially automotive and aerospace companies, because of the optimization provided by All Dynamics. As a result of the experiment, graphene will gain a stronger foothold in the composites market as a mechanical performance-enhancing and weight-reducing additive, both of which are highly desired properties for aerospace applications.

Benefits
• All Dynamics expects to save over €200,000 per year because faster tests are necessary
• All Dynamics expects an increase in revenue up to €7,500,000 during the next 3-4 years
• Within 3 years, Nanograft expects to increase sales of graphene-related products by a factor of 50.

EuroCC success stories booklet-1:

https://www.eurocc-access.eu/wp-content/uploads/2023/07/EuroCC_booklet_2023_final.pdf

FF4EuroHPC success stories booklet:

<https://www.ff4eurohpc.eu/en/multimedia/booklet/>

EuroCC success stories booklet-2:

https://www.eurocc-access.eu/wp-content/uploads/2024/09/EuroCC2_Booklet2024_v1.0.pdf

How we help companies?



Company's PoC Application



Evaluation of the PoC Application



PoC Study (6 Months)



PoC Outcome - Success Story



Measuring Company's HPC Level - Maturity Assessment



Directing the Company to the EuroHPC JU calls

Communication Channels

VISIBILITY

ANNOUNCEMENT LISTS

UP-TO-DATE WEB PAGE

SOCIAL MEDIA CHANNELS

NEWSLETTER



986
Followers

@EuroCC_Turkey



1783
Followers

@EuroCC_Turkey



1900
Subscribers

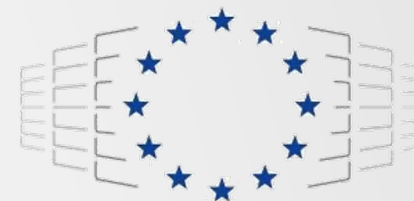
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Thanks!



EuroHPC
Joint Undertaking

Funded by the European Union. This work has received funding from the European High Performance Computing Joint Undertaking (JU) and Germany, Bulgaria, Austria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Lithuania, Latvia, Poland, Portugal, Romania, Slovenia, Spain, Sweden, France, Netherlands, Belgium, Luxembourg, Slovakia, Norway, Türkiye, Republic of North Macedonia, Iceland, Montenegro, Serbia under grant agreement No 101101903.