The Need for Materials Acceleration

Sustainability
advancing materials science is crucial for a greener and more resilient future.

Strategic Autonomy
reducing dependence on external resources is key for industrial sovereignty.

Economic Opportunity
over $30 trillion in economic activity is expected in the next 30 years — around 40% of current global GDP — driven by materials innovation.
(BCG Report: Looking to Nature for the Next Industrial Revolution, 2021)

www.cost-daemon.eu

This publication is based upon work from COST Action DAEMON, CA22154, supported by COST (European Cooperation in Science and Technology). COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Funded by the European Union

DAEMON

Accelerating the discovery, design, and commercialization of advanced materials through AI, automation, and emergent computing approaches.

Vision and Objectives

DAEMON COST is a European network committed to popularizing and democratizing emergent computing, AI, and automation approaches to accelerate materials discovery, design, and commercialization.

Our guiding principles

- No fragmentation of standards
- Minimal duplication of efforts
- A rich and inclusive talent pool
- Holistic understanding of process–structure–property relationships
- Multi-modal and multi-fidelity approaches
- Trustworthy and explainable AI
- Capacity building and coordinated research efforts

Structure & Philosophy

Our work is organized into five Working Groups (WGs):

WG1: Community standards & reproducibility

WG2: Representations & algorithms

WG3: Multi-modal & agentic AI

WG4: Materials structure–process–property relationships

WG5: Training, communication & valorization

Selected highlights

Accurate resolution of quantum-mechanical calculations

Predicting optical properties of nanoparticles for biomedical use

Automated modelling of amorphous materials for energy and defense

Novel insights into cement structures for a sustainable built environment

DAEMON COST in numbers

300+ members

40+ countries

60% early-career researchers <40 years old

50/50 Balanced gender representation

400+ attendees across multiple training schools

What's next →

A unique European materials ecosystem addressing discovery, design, and deployment across all scales.