



Experimental Search for Quantum Advantages in Thermodynamics

Fact Sheet

Project Information

ESQuAT

Grant agreement ID: 101041744

DOI

[10.3030/101041744](https://doi.org/10.3030/101041744)

EC signature date

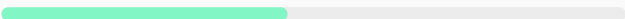
4 October 2022

Start date

1 January 2023

End date

31 December 2027



Funded under

European Research Council (ERC)

Total cost

€ 2 124 089,00

EU contribution

€ 2 124 089,00

Investment in EU policy priorities

Digital agenda	☐	Clean air	☐
Artificial Intelligence	☐	Climate action	☐
Biodiversity	☐		

Coordinated by

CHALMERS TEKNISKA
HOGSKOLA AB
 Sweden

Project description

Harnessing heat exchanges from quantum mechanics

The laws of thermodynamics frame our understanding of engines and heat exchanges, but discoveries in quantum mechanics show that they may need an update. The EU-funded ESQuAT project seeks to shed light on this by creating a

new test circuit for experiments with quantum thermal machines. Researchers will develop an engineered physical bath that can be populated with any spectral distribution. This can then be connected to quantum thermal machines and heat flows can be spectrally tracked. The project will also test three types of refrigerators that cool based on the quantum principles of coherence, measurement backaction and collective effects. The ultimate objective is to make more powerful engines, faster-charging batteries and devices that reduce energy waste.

Fields of science (EuroSciVoc)

[natural sciences](#) > [physical sciences](#) > [thermodynamics](#)

[social sciences](#) > [law](#)



Keywords

[quantum thermodynamics](#)

Programme(s)

[HORIZON.1.1 - European Research Council \(ERC\)](#)

MAIN PROGRAMME

Topic(s)

[ERC-2021-STG - ERC STARTING GRANTS](#)

Call for proposal

[ERC-2021-STG](#)

[See other projects for this call](#)

Funding Scheme

[HORIZON-ERC - HORIZON ERC Grants](#)

Host institution



CHALMERS TEKNISKA HOGSKOLA AB

Net EU contribution

€ 2 124 089,00

Total cost

€ 2 124 089,00

Address

-
412 96 Goteborg
 Sweden 

Region

Södra Sverige > Västsverige > Västra Götalands län

Activity type

Higher or Secondary Education Establishments

Links

- [Contact the organisation](#) 
- [Website](#) 
- [Participation in EU R&I programmes](#) 
- [HORIZON collaboration network](#) 

Beneficiaries (1)



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Last update: 10 October 2022

Permalink: <https://cordis.europa.eu/project/id/101041744>

European Union, 2025