First years of the DENSE community – the Doctoral Education Network of SAFER

What is DENSE?

1. New salary funding instrument in SAFER2028 for doctoral candidates
2. Operational funding for scientific activities and mobility
3. Networking of doctoral candidates

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https://safer2028.fi/dense/

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- DENSE network in January 2026
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Background

- Nuclear safety and nuclear waste management: multi-disciplinarity
- Evaluations of past SAFIR and KYT programmes: scientific level
- Various benefits of networking and expanding views

- DENSE postulated in SAFER2028 Framework Plan (MEAE 2022:43)
- Supervised by Steering Group 5
- Coordinated by Aalto, LUT and UH

DENSE network in January 2026

- Mailing list dense-network@list.aalto.fi: 90 addresses
  - 49 PhD students
  - 20 supervisors and instructors
  - 21 others (SG5, SAFER administration and management etc.)
- 8 universities and 4 research institutes represented
- 12 messages were sent to mailing list in 2025
- The web site https://safer2028.fi/dense/ also in use

DENSE salary funding

- In 2023-25, 5 PhD students received salary funding from DENSE projects
  - Other SAFER projects provided salaries for many more PhD students
- CORF (Aalto) 2023
- REST (UEF) 2023-26
- SurePhD (UH) 2023-26
- MOXSEAL (UH) 2024-27
- NCGDENSE (LUT) 2024-27

- Two new DENSE projects starting in 2026

Funding for mobility and activities (1/2)

- Funding of 38 k€ available annually for mobility and other scientific activities of DENSE network members
  - Participation in conferences, workshops, and summer schools and other mobility
  - Funding for publications, infrastructure, equipment, and materials
- Two funding calls per year: February and August-September
  - Limitation: accepted funding must be used by end of January
- Applications collected by DENSE coordinator, decisions made by SG5

Funding for mobility and activities (2/2)

Funding calls of 2023-2025 in a nutshell:

- Spring 2023: 9 applications, 7 accepted (12.0 k€)
- Autumn 2023: 2 applications, 2 accepted (2.3 k€)
- Spring 2024: 8 applications, 8 accepted (13.5 k€)
- Autumn 2024: 1 application, 1 accepted (1.5 k€)
- Spring 2025: 11 applications, 11 accepted (18.1 + 6.3 k€)
- Autumn 2025: 6 applications, 4 accepted (5.2 + 6.0 k€)

- In 2025 calls, the latter sum is for materials and equipment

Annual seminars (2023, 2024, 2025)

- DENSE annual seminars held in late August
  - 2023 Design Factory, Aalto, Espoo 37 participants, 15 presentations
  - 2024 Metsätalo, UH, Helsinki 47 participants, 15 presentations
  - 2025 TUNI main building, Tampere 34 participants, 16 presentations
  - 2026 ??? (tbd)
- Two days (not full) and dinner
  - Starting with lunch and ending with afternoon coffee the favorite concept
  - Participant feedback has been very positive, both on seminar contents and on networking opportunities

ATS Ydintekniikka 3/2023 s. 14-15

An article about the first annual seminar of DENSE at Aalto Design Factory, published in the member magazine of Finnish Nuclear Society.

The heading is a hyperlink to the article.

Rankkasadetta ja pienreaktoreita

DENSEn ensimmäinen vuosiseminaari Otaniemessä 28.–29.8.2023

Ydinturvallisuuden ja ydinjätehuollon tutkimuskenttään kuuluu tieteenaloja fysiikasta, kemiasta, geologiasta ja insinööritieteistä psykologiaan ja sosiologiaan. Kun altistetaan nuoret tutkijat tähän monitieteelliseen maailmaan, voidaan saada aikaan asiantuntijoita, jotka ymmärtävät oman erityisalansa lisäksi sen liitynnät suurempaan kokonaisuuteen. Tämä ymmärrys on keskeistä sekä tieteenalojen että kokonaisturvallisuuden edistymisen kannalta.

Teksti ja kuvat: Jarmo Ala-Heikkilä

merossa 3/2015. Toimintavuosiensa aikana YTERAan osallistui yli 40 tohtoriopiskelijaa ja sen puitteissa julkaistiin yli 20 väitöskirjaa, joten konsepti oli selkeästi tuloksellinen.

YTERAlle koitti kuitenkin ennenaikainen loppu, koska opetus- ja kulttuuriministeriö (OKM) ja Suomen Akatemia (SA) päätyivät vuonna 2013 uudistamaan suomalaisen tohtorikoulutuksen. Aiemmasta keskitetystä mallista, jossa tohtorikoulutusverkostot perustettiin SA:n päätöksellä, siirryttiin yliopistojen ”autonomiaa” korostavaan malliin. Lainausmerkit ovat tarpeen, koska valtaosa yliopistojen tutkimuksesta rahoitetaan kilpaillulla rahoituksella, jota myöntävät SA, EU ynnä muut rahoittajat omilla kriteereillään.

Verkosto osaksi tutkimusohjelmaa

Vuoden 2016 uudessa tilanteessa oli tavoitteena jatkaa YTERAn kaltaista toimintaa yliopistojen kesken. Kun kuitenkin kansalliselta verkostolta puuttui keskitetty rahoitus, yhteistoiminta jäi satunnaiseksi.

Positiiviset kokemukset YTERAsta jäivät toimijoiden takaraivoihin. SAFER2028-tut-

First annual seminar of DENSE at Aalto Design Factory

DENSE Annual Seminar 2025 program (1/2)

16 presentations in total

- Two keynotes (SKB, Steady Energy)
- Three stakeholder talks (GTK, Tuni, UofOulu)
- Two senior researcher presentations (UH, VTT)
- Nine PhD project presentations (Aalto*2, LUT*3, PSI, STUK, UEF, UH)

- Details on the next page

DENSE Annual Seminar 2025 program (2/2)

Session 1

Opening and welcome	Jarkko Akkanen, UEF & SG-DENSE
Materials research at Tampere University	Erkka Frankberg, Tuni
Effects of hydrogen in spent nuclear fuel disposal canister materials	Patrik Sahiluoma, Aalto
Status and perspectives of release and dissolution of non-condensable gas	Sharandeet Singh, LUT
Keynote: *District heating with LDR-50 Small Modular Reactor*	Lauri Muranen, Steady Energy

Session 2

New developments in the modeling and analysis of radiation damage in nuclear materials	Evgeniia Ponomareva, Aalto
Advanced oxidation processes with cavitation for decontamination processes	Lauri Pettilä, HY
Small modular reactors in Espoo? Deliberation panels on SMRs as a case study	Maare Käis, LUT
Keynote: *Nuclear waste management in Sweden: SKB's mission*	Francesco Messi, SKB

Session 3

Non-destructive measurements of spent nuclear fuel before geological disposal with PGET and PNAR	Riina Virta, STUK
Microscopy for the characterization of nuclear materials	Glen Kiely, Aalto
Duffing model for nonlinear behavior of nuclear fuel rod vibrations	Roxana Contreras Gonzalez, LUT
Multimodal synchrotron and neutrons characterization of Additive Manufactured FM steel for nuclear applications	Natan Garrivier, PSI
Mineral wastes and cements research at University of Oulu: aspects for nuclear waste management	Juho Yliniemi, University of Oulu

Session 4

GTK - At the core of nuclear safety research	Jukka Kuva, GTK
Replacement chemicals for hydrazine in pressurized water reactor secondary side circuits	Konsta Sipilä, VTT
Inhalation of common radioactive particles – what happens after they deposit in the lung?	Gareth Law, HY
Closing of the seminar	Jarkko Akkanen, UEF & SG-DENSE

Joining instructions

IF

Your PhD research project is related with nuclear safety or nuclear waste management

AND

Your salary funding comes from any (legal) source

THEN

Contact DENSE coordinator (see first page)

ENDIF

Welcome to join in DENSE network activities!

You may invite your supervisor and instructor, too.