2021 AT A GLANCE
Graphic summary of the annual report

Kavli Institute for Systems Neuroscience
Dear reader

It has been a challenging year for the world, but it has left us stronger.

In 2021, the Kavli Institute has grown by four new research groups, one new research centre, and an experienced administrative director. We made new discoveries about the brain’s remarkable mechanisms and abilities; we educated promising next-generation neuroscientists; we increased the proportion of female leaders and are two steps closer to our goal of a truly diverse and gender-balanced workforce; we invented next-level neuroscience tools to be shared freely, open-source and open-access, as all knowledge should be.

Please enjoy our graphic summary of 2021 in facts and figures.

For first access to the most recent brain discoveries made by our Trondheim team of researchers, focus your mobile camera at the QR-code on the back cover of this folder and follow the instructions.

May-Britt Moser, Edvard Moser, Bjarne Foss
Directors of the Kavli Institute for Systems Neuroscience
Organisational chart 2021

TRINITY OF DIRECTORS

EDVARD MOSER
Scientific Director

MAY-BRITT MOSER
Scientific Director

BJARNE FOSS
Administrative Director

RESEARCH GROUP LEADERS

MAY-BRITT MOSER
Moser Lab

EDVARD MOSER
Moser Lab

MENNO WITTER
Witter Lab

EMRE YAKSI
Yaksi Lab

GIULIA QUATTROCOLO
Quattrocolo Lab

TOBIAS NAVARRO
SCHRÖDER
Navarro Schröder Lab

YASSER ROUDI
Roudi Lab

JONATHAN WHITLOCK
Whitlock Lab

CLIFFORD KENTROS
Kentros Lab

MAXIMILIANO NIGRO
Nigro Lab

MARYAM ZIAEI
Ziaei Lab
The Kavli Institute for Systems Neuroscience is a leading research environment in Trondheim. The lab that preceded the institute was founded by Nobel Laureates May-Britt Moser and Edvard Moser in 1996 to investigate the emergence of higher brain functions.

Today, the Kavli Institute is an interdisciplinary village of experts with the common desire to understand how complex information is encoded in high-level neural networks and how complex behaviours arise from these codes and systems.

The institute staff is organized in ten research groups and several support groups such as Animal Tech, Technical Group, Kavli Communication, and an Administrative team.

Centres
The neuroscience research institute, led by Edvard Moser, May-Britt Moser and Bjarne Foss, now comprises four research centres:

- Centre for Neural Computation (CNC)
- Egil and Pauline Braathen and Fred Kavli Centre for Cortical Microcircuits (BKC)
- K.G. Jebsen Centre for Alzheimer's Disease (JCA)
- Mohn Research Center for the Brain (MCB)

Education
The department is responsible for an international master's degree programme in neuroscience. It has joint responsibility for the PhD programme in medicine and health sciences at NTNU. The Norwegian Research School in Neuroscience (NRSN) is organised and run by the institute with support and participation of the major Norwegian universities.

Infrastructure
The institute is the national host of NORBRAIN, a large-scale infrastructure for neuroscience technology, with facilities located at the University of Oslo (UiO), the University of Bergen (UiB), and the Norwegian University of Science and Technology (NTNU) in Trondheim. The institute is also host to the only Viral Vector Core in Norway, supplying labs across the world with state-of-the-art viral research tools.

History
The Kavli Institute for Systems Neuroscience consists of a Centre of Excellence (CoE) awarded by the Research Council of Norway since 2002, a Kavli Foundation Institute since 2007, a Braathen-Kavli Centre since 2015, a department at the Faculty of Medicine and Health Sciences at Norwegian University of Science and Technology (NTNU) since 2017, a Foundation Stiftelsen Kristian Gerhard Jebsen Centre since 2020, and a Trond Mohn Foundation Research Centre since 2021.
Visit from The Research Council of Norway

TOOLING UP:
September 2021, Mari Sundli Tveit, CEO of The Research Council of Norway, visited the Kavli Institute. She learned about the recent technological innovations of neuroscience research tools developed/co-developed at the Kavli Institute, like Mini2P (2022), Neuropixels 2.0 (2021), and the Viral Vector Core (2019).

Here with Bjarne Foss, May-Britt Moser, Edvard Moser, Yoram Burak, Siri Forsmo (Dean), Rajeev Kumar Nair Ravindran, Maryam Ziaei, Ruben Queije de Vale, Soledad Gonzalez Cogno, Hanna Enevist, and Emilie Ranheim Skyta. 
1. Steinmetz NA, ..., gardner RJ, ..., Vollan AZ, ... Lee AK, ...  
11. Maryam Ziaei, ...  
12. Emre Yaksi, ...  
13. Yasser Roudi, ...  
14. Clifford Kentros, ...  
15. Menno Witter, ...  
16. Giulia Quattrocolo, ...  
17. May-Britt Moser, ...  
18. Giuli Quattrocolo, ...  
19. May-Britt Moser, ...  
20. Emre Yaksi, ...
Facts

30 nationalities represented in KISN's workforce of 151 employees
85 international employees
66 Norwegian employees
### Annual accounts 2021

#### INCOME

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount (NOK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Council of Norway (RCN): Centre of Excellence (CoE)</td>
<td>23,700,000</td>
</tr>
<tr>
<td>RCN FRIPRO, infrastructure, and other</td>
<td>23,800,000</td>
</tr>
<tr>
<td>EU Research Framework Programme (incl. ERC)</td>
<td>12,500,000</td>
</tr>
<tr>
<td>Other public/private (K.G. Jebsen, T. Mohn, TFSR, matching, KD, etc.)</td>
<td>36,200,000</td>
</tr>
<tr>
<td>Norwegian University of Science and Technology</td>
<td>41,600,000</td>
</tr>
<tr>
<td>Ministry of Education and Research: Mosers Nobel Prize Funds</td>
<td>12,200,000</td>
</tr>
<tr>
<td><strong>TOTAL INCOME</strong></td>
<td><strong>150,000,000</strong></td>
</tr>
</tbody>
</table>

#### EXPENSES

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount (NOK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payroll and indirect expenses</td>
<td>91,700,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>15,200,000</td>
</tr>
<tr>
<td>Other operating expenses</td>
<td>43,100,000</td>
</tr>
<tr>
<td><strong>TOTAL EXPENSES</strong></td>
<td><strong>150,000,000</strong></td>
</tr>
</tbody>
</table>

75 per cent of the institute’s total income is derived from external competitive funding, whereas 25 per cent is semi-permanent institute funding from the Norwegian government and the institute’s research fund, TFSR.

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**THE RESEARCH FUND OF THE KAVLI INSTITUTE FOR SYSTEMS NEUROSCIENCE**

Trondheim Foundation for Scientific Research (TFSR)

TFSR is a non-profit organization with the sole purpose of providing research funds to the Kavli Institute for Systems Neuroscience, in support of scientific advancement in the field of fundamental neuroscience to the benefit of humanity.

Approximately one-half of the Foundation’s research fund comes from The Kavli Foundation, established by the late Norwegian-American businessman and philanthropist Fred Kavli. Other major contributors are Pauline Braathen and the nieces and nephew of Sig Østbye, the Norwegian organization Ensliges Landsforbund (EL), Selskabet for Trondhjems Bys vel, Sparebankstiftelsen SMN, Gymnasticsfondet, and since 2021 Nils-Jarle Sætre with his successful fundraising campaign “Til topps mot Alzheimer”. In addition, the Foundation has received larger and smaller amounts from individuals, companies, organizations, as well as testamentary gifts and donations from funerals. TFSR appreciates all contributions.

The image to the right: The Foundation visited the Kavli research labs in November 2021. From left to right: Gunnar K. Nilsen, May-Britt Moser, Hans Jørgen Stang, Edvard Moser, Janicke Udbye Løvaas, Bjarne Foss, Jan Morten Øyrstad, Rune Hågland, Anne Lise Ryel.
Boards

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Dean Faculty of Medicine and Health Sciences, NTNU

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Director
St. Olav’s Hospital

Stig Siardahl
CEO Central Norway Regional Health Authority

Jan Morten Dyrstad
Treadway Foundation for Scientific Research (TFSR)
Faculty 2021

May-Britt Moser
Professor
Director of Centre for Neural Computation

Edvard Moser
Professor
Director of KISN

Menno Witter
Professor

Yasser Roudi
Professor

Jonathan Whitlock
Associate professor

Clifford Kentros
Professor

Emre Yaksi
Professor

Christian Doeller
Professor 20%

Giulia Quattrocolo
Researcher

Tobias Navarro Schröder
Associate professor

Maximiliano Nigro
Researcher

Maryam Ziaei
Associate professor

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WE MOVE ALONG THE SURFACE OF A DONUT

Whether the rat is exploring, running, dreaming, or resting deeply asleep, its brain’s GPS is constituted by the joint activity of grid cells, always moving along the surface of a torus. This first insight into how the mammalian brain organizes high-level brain function in neural networks, also labelled grid cells 2.0, was published on BioRxiv in 2021 by Kavli researchers (peer-reviewed version published in Nature, 2022).

The cover image, and the image you see above, are artistic interpretations of the donut we navigate by, made by Helmet and Kavli Communication.

The image to the right shows the neural data from a network of grid cells in the brain of Roger the rat, collected by Moser Group researcher Richard Gardner.