



**EUROPEAN
SPALLATION
SOURCE**



Welcome and Science Update

IKON 18

ANDREAS SCHREYER

24 FEBRUARY 2020

E-Hall Handover

IKON 17



E-Hall Installation

Status Dec 19th

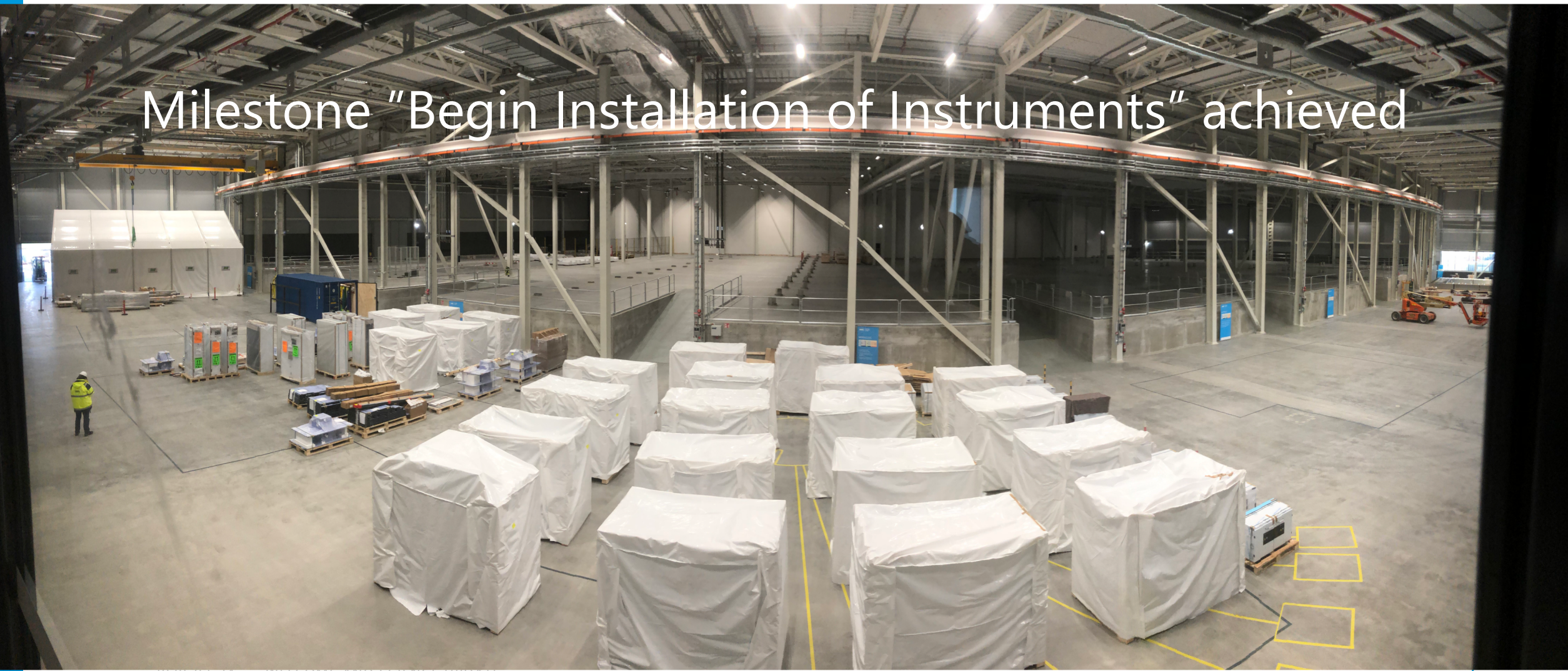




E-Hall Installation

Status Dec 19th

Milestone "Begin Installation of Instruments" achieved





DMSC Data Center Opening

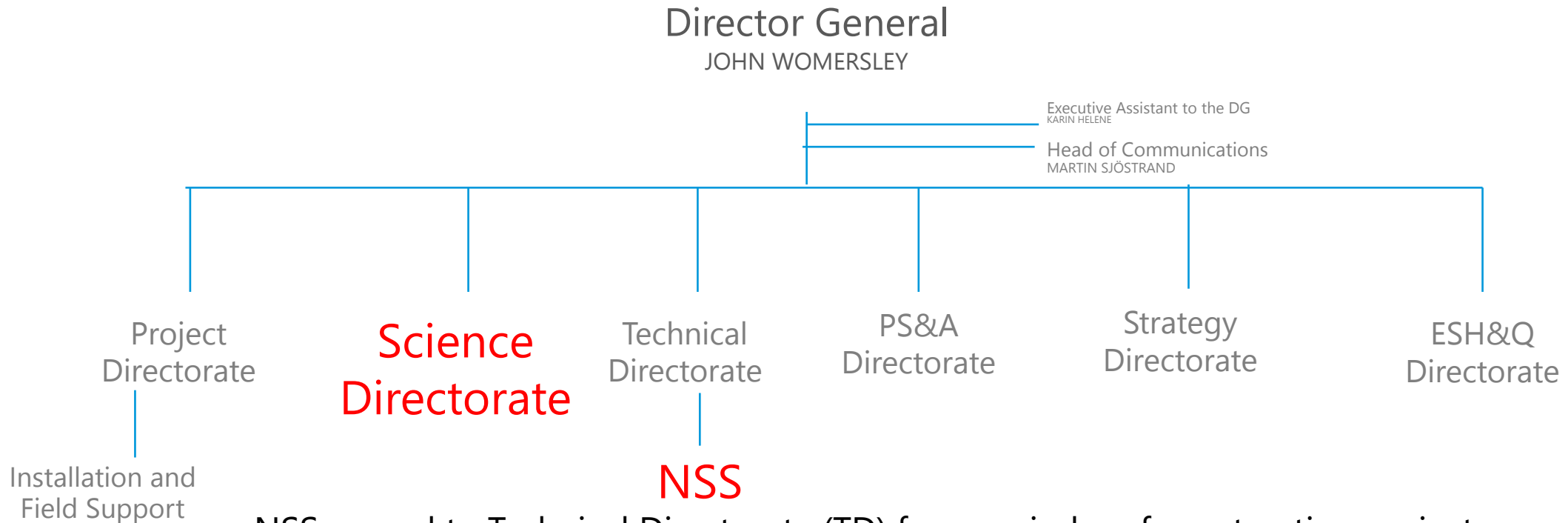
29 October 2019



UPDATE

ESS Organisational Structure: Science

as of 1 October 2019



- NSS moved to Technical Directorate (TD) for remainder of construction project
- NSS focussed on instrument construction scope
- Other scope (sample env., data storage and analysis, labs,...) remains in Science Directorate (SD)
- Operation of and Science with instruments remains scope of the SD
- Instruments will move back to SD with their TG5
- Support groups (e.g. detectors) will move back to SD with TG5 on three instruments
- First Science and Start of User Programme: Science Directorate
- For In-Kind partners: no change, your points of contact are the same

Scope of the Science Directorate

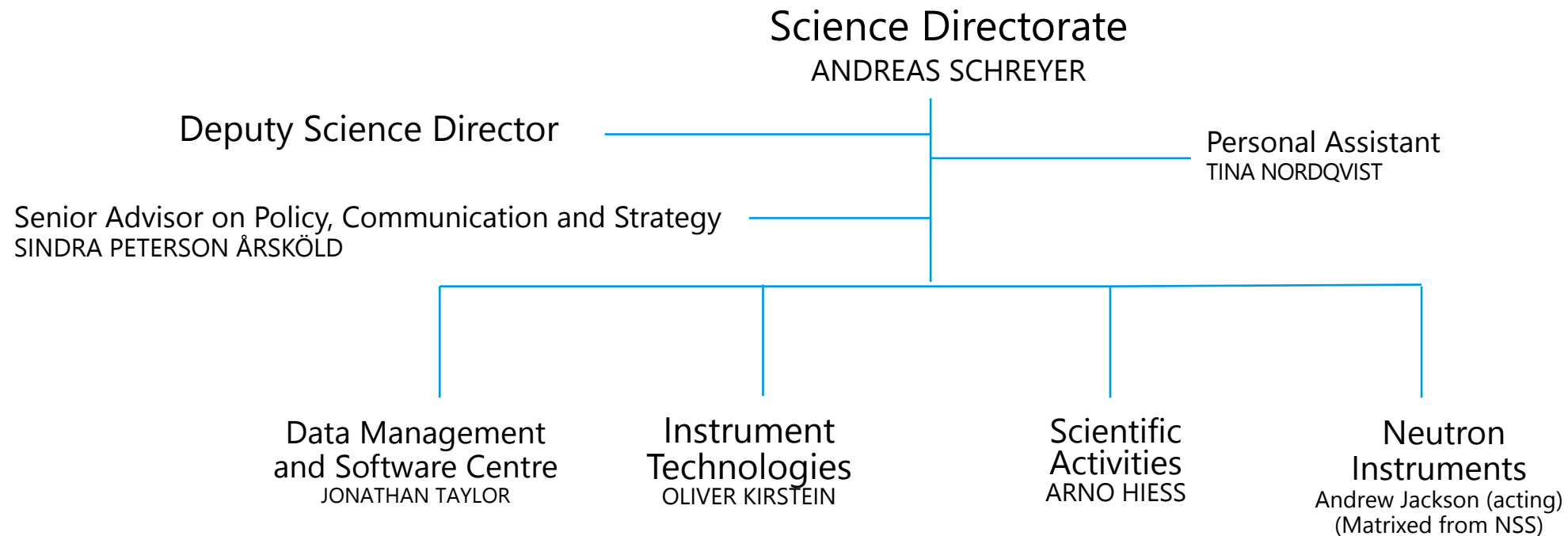


- Scientific Advocacy and Programme Development
- Prepare for First Science and Start of User Programme
- Scientific Activities including User Programme
- DMSC activities not related to Data Acquisition
- Sample Environment Equipment
- MCA systems
- Laboratory Facilities

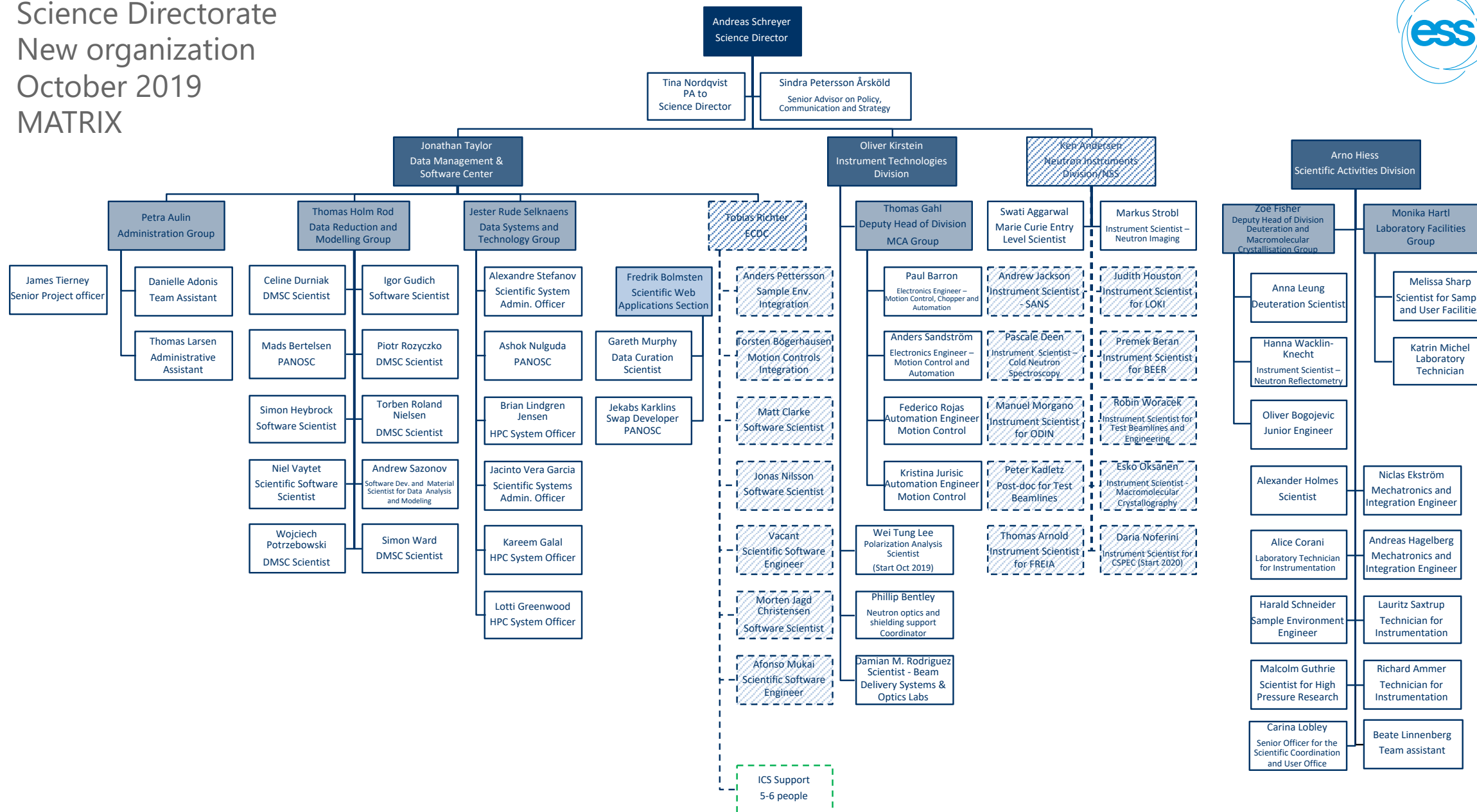
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Science Directorate New organization October 2019 MATRIX



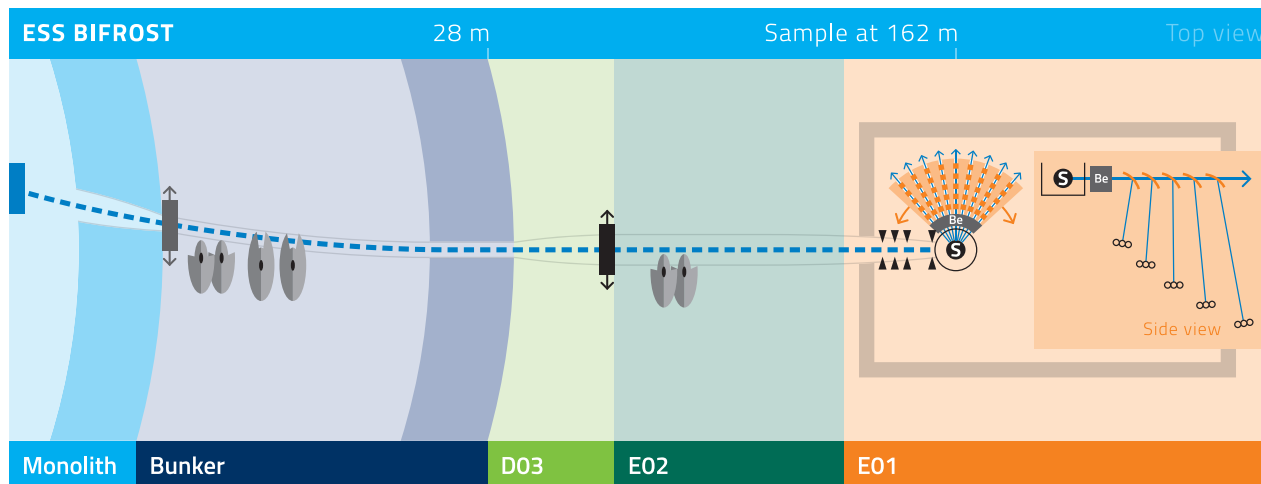
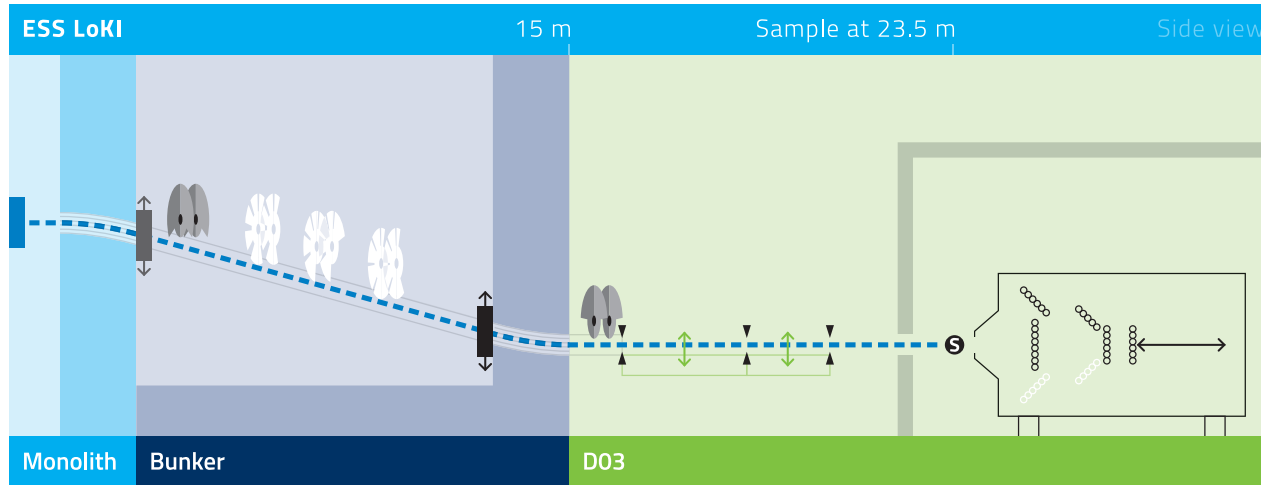
Big Instrument Paper

Finally published!



Contents lists available at ScienceDirect

Nuclear Inst. and Methods in Physics Research, A

journal homepage: www.elsevier.com/locate/nima

The instrument suite of the European Spallation Source

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⁴ Jülich Centre for Neutron Science JCNS, Forschungszentrum Jülich GmbH, 52428 Jülich, Germany

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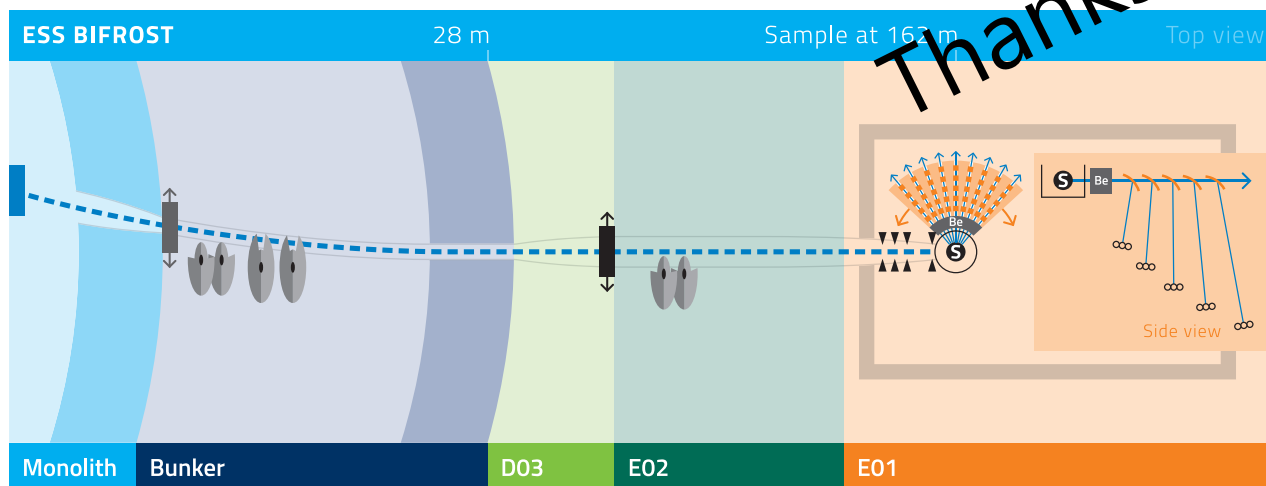
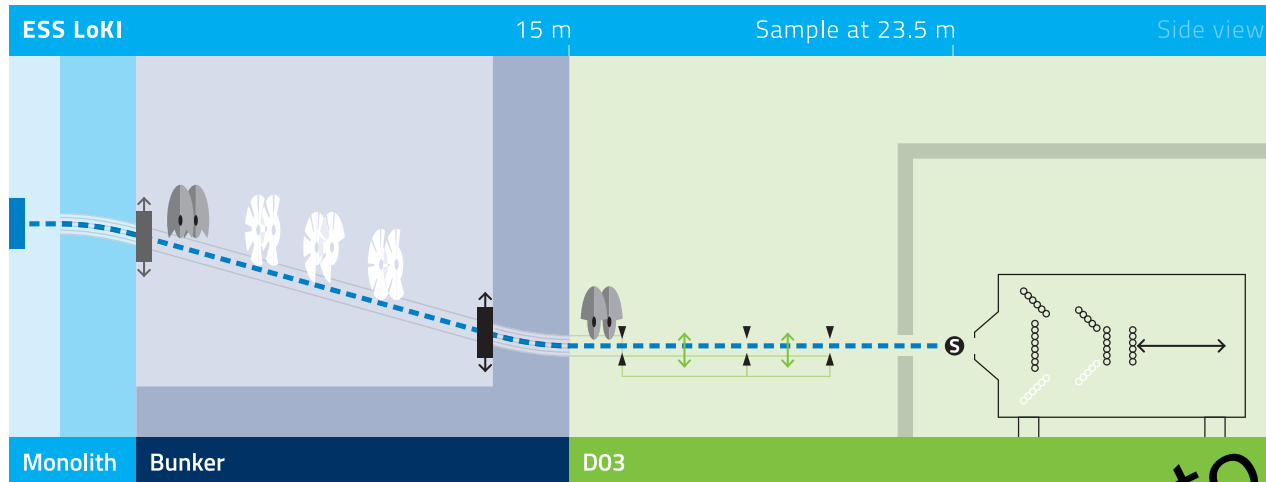
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^b Current address: Oak Ridge National Laboratory, 1 Bethel Valley Road, Oak Ridge, TN 37830, USA.



Thanks to everybody!

Joint ESS – MAX IV Science Colloquia



Joint ESS - MAX IV
Science Colloquium
 15 May 15:15

Large Spiders at Small Angles
 Why is silk so fascinating? How do spiders spin their webs? How are we trying to understand it? Why are we yet to copy it?

Ann Terry
 Researcher
 Group Manager for Diffraction and Scattering
 MAX IV Laboratory
 Lund

Conference room MAX III at MAX IV
 Coffee will be served at 15:00

Joint ESS - MAX IV
Science Colloquium
 12 June 15:15

The way to first Science at European XFEL
 The 3.5 km long hard X-ray Free Electron Laser European XFEL providing an extremely intense X-ray beam was taken into user operation in September 2017 after about 10 years of construction. Today all 6 instruments are in user operation after an intense and ultra-short period of commissioning. The way to first user operation and the present status will be discussed along with the first user publications.

Robert Feidenhans'l
 Managing Director
 European XFEL
 Hamburg

Conference room Saturn at ESS
 Coffee will be served at 15:00

Joint ESS - MAX IV
Science Colloquium
 13 November 15:15

Magnetism – a useful ally for probing the superconducting state
 Superconductors come in two flavours, depending on how firmly they expel magnetic fields: they are either dogmatic on the subject, or pragmatic, permitting some flexibility. Most useful superconductors fall into the latter category. In this talk, I will explain how this pragmatism manifests, and can be exploited, both for practical purposes, and as a means of better understanding the underlying physics.

Elizabeth Blackburn
 Professor
 Lund University

Conference room MAX III at MAX IV
 Coffee will be served at 15:00

Joint ESS - MAX IV
Science Colloquium
 24 April 15:15

NaV₂O₄: Low-dimensional Magnet or Energy Storage Material... or Both?
 At low temperatures it's magnetic. At room temperature it allows ion diffusion, making it promising for energy storage applications. How can one material have such disparate properties, and are the two related?

Martin Månsson
 Associate Professor of Applied Physics and Neutron Scattering
 KTH Royal Institute of Technology
 Stockholm

European Spallation Source Conference room Saturn
 Coffee will be served at 15:00

Joint ESS - MAX IV
Science Colloquium
 18 September

How do we inhibit cancer promoting enzymes?
 In the era of smart medicine and individualized drug therapy, it is important to understand how drugs work on a molecular level. This talk focuses on how drugs promote cancer metastasis, and how it can be inhibited. Promotes cancer metastasis, and how it can be inhibited. Crystallography are used to elucidate the molecular ground-work for more effective cancer therapy.

Zoë Fisher
 Group Leader
 Deuteration and Macromolecular Crystallization support lab,
 European Spallation Source

Conference room MAX III at MAX IV
 Coffee will be served at 15:00

Joint ESS - MAX IV
Science Colloquium
 16 October 15:15

Superconductivity with Strong and Fragile Flavors
 The quantum phenomenon of superconductivity has intrigued scientists for decades, raising fundamental questions on the nature of matter. With a seemingly inexhaustible supply of new discoveries, this research has tremendous application potential, spanning from energy economy to medical diagnostics.

Johan Chang
 Professor
 University of Zürich

Conference room Brightness at ESS
 Coffee will be served at 15:00

Joint ESS - MAX IV
Science Colloquium
 11 December 15:15

Looking up close at the microstructure of human lung and nerve tissue
 Imaging with synchrotron radiation has attained the sensitivity and resolution required to look at the detailed microstructures of biological samples. This method helps us understand health and disease at a fundamental level, providing information on e.g. the neural tissue in diabetic patients and the role of lung blood vessels in cardiovascular diseases.

Martin Bech
 Associate Professor
 Lund University

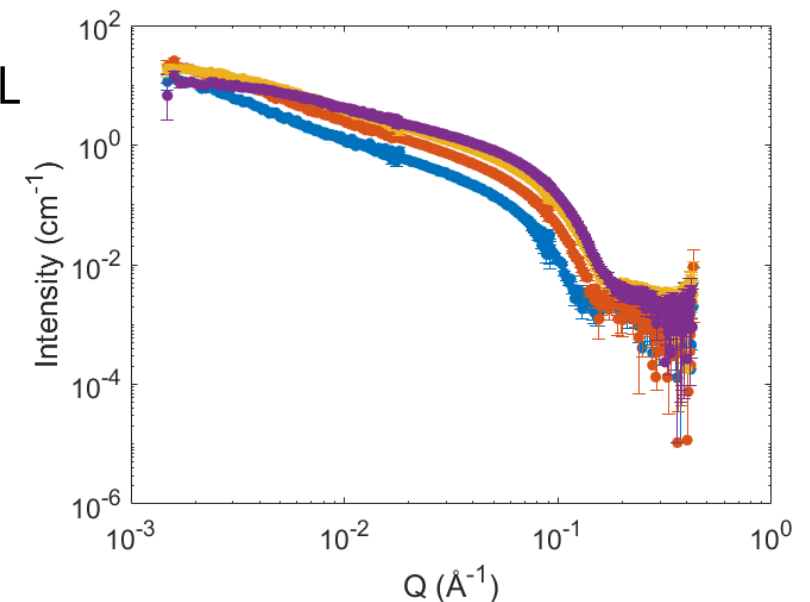
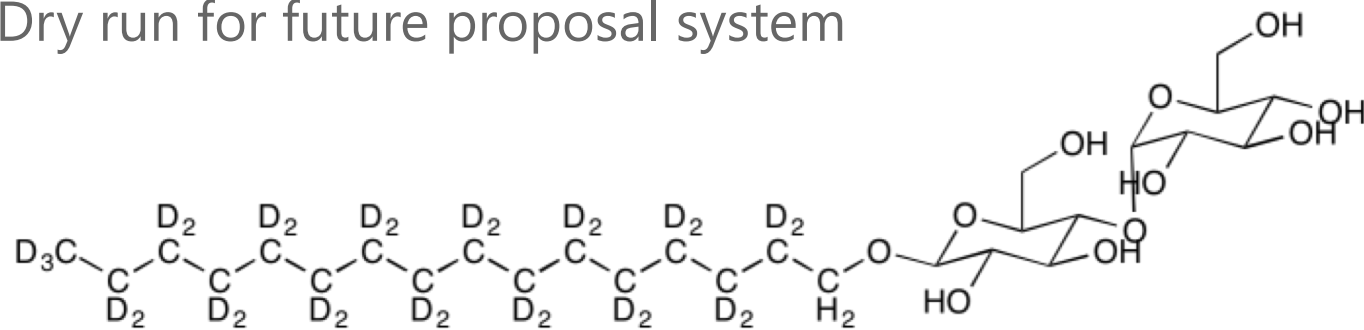
Conference room Saturn at ESS
 Coffee will be served at 15:00

We already have users!

Support Service for Deuteration and Macromolecular Crystallization

Proposals from first pilot call being executed;

- several done for experiments: <https://deuteration.net/2019/09/02/the-first-molecules-requested-from-the-ess-demax-team-have-been-delivered-and-utilised-in-a-successful-neutron-experiment/>
- Several to be continued in 2020
- Hit the ground running for First Science
- Dry run for future proposal system





^3He Polarisation

Activity finally started

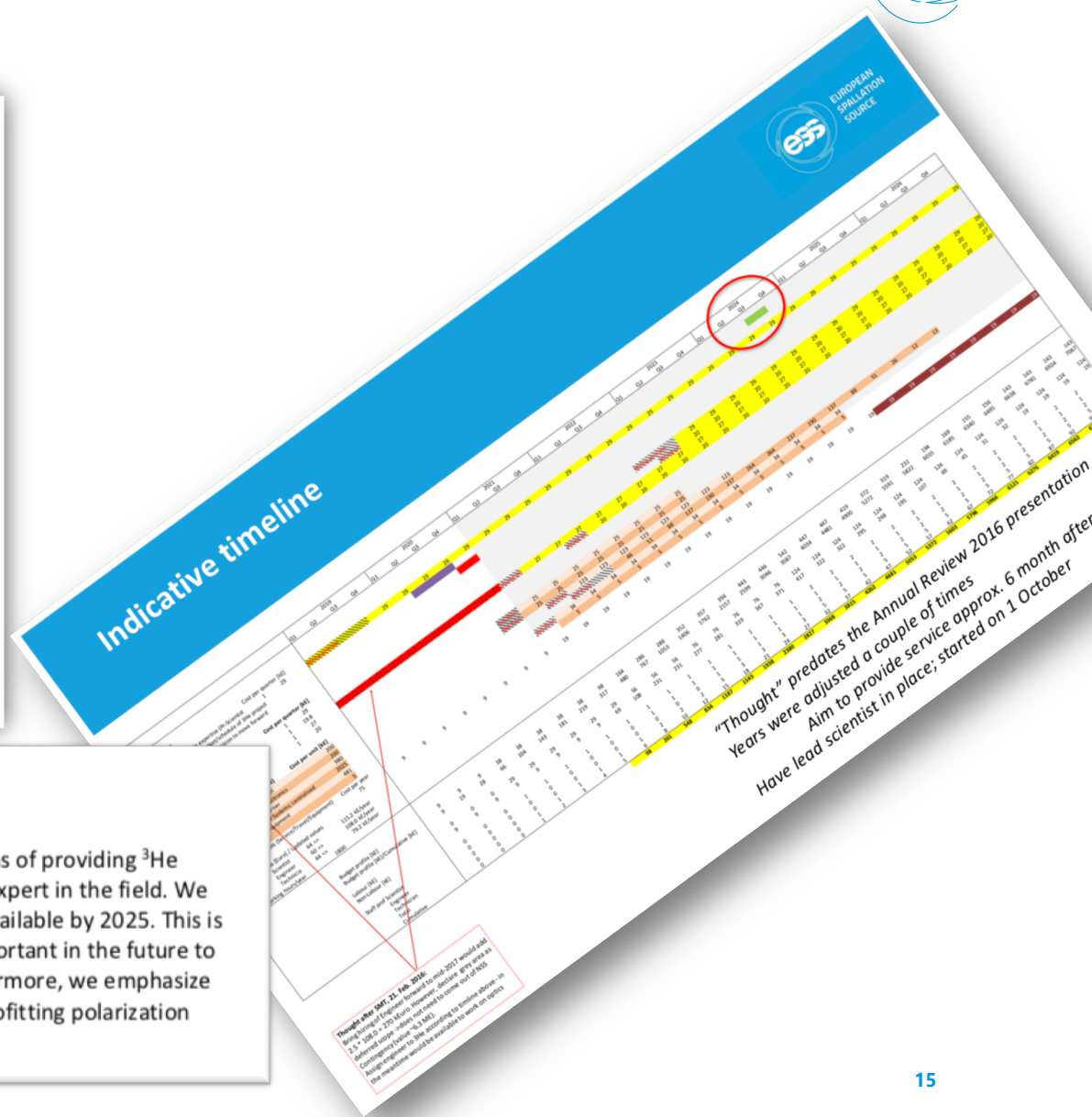
Lead scientist



• Wai Tung (Hal) Lee



- Previous relevant experience (2003 – 2019)
 - Established central ^3He polarisation system (MEOP) for neutron scattering instruments at ANSTO in collaboration with ILL. Developed methodology and data reduction methods for experiments using polarized ^3He technique.
 - Built polarized ^3He gas filling station (SEOP) for medical imaging applications in collaboration with Monash Biomedical Imaging Centre at the Monash University and the University of Queensland
 - Built *in-situ* polarising SEOP analyser at the SNS for the Magnetism Reflectometer. Developed techniques to use polarised ^3He neutron spin filter in polarised neutron scattering



Received positive and supportive feedback from SAC

^3He Polarization:

We are pleased to see that our recommendation to advance in terms of providing ^3He polarization was taken into account, and that ESS has recruited an expert in the field. We recommend advancing this as fast as possible in order for it to be available by 2025. This is important mainly to the magnetism community but can also be important in the future to other areas of increasing interest as soft matter and biology. Furthermore, we emphasize the importance of building instruments in a way that allows for retrofitting polarization capabilities later.

Good Bye V20 and BER II

- DAQ / Controls system demonstrated on V20
- Experiment Control, Event Formation, Data Acquisition, File Writing, Data Curation are all working
- ECDC/controls integration scope also successfully demonstrated there (choppers, motion, sample environment, detector readout, timing, iCS)
- Detectors
- ...



Peter Kadletz von der ESS und Lamar Moore von der Neutronenquelle ISIS.



Joint ESS ILL User Meeting 2020

Date and Venue

Wed 23rd – Fri 25th September 2020

Lund: Rooms in AF Borgen, Universitetshuset and Palaestra



ESS ILL User Meeting 2020
Lund, Sweden
23-25 September 2020

- Welcome to the second ESS ILL User Meeting
- Plenary talks about using neutron science to meet societal challenges
 - Reports on recent achievements and ongoing work at ESS and ILL
 - Focused parallel sessions on specific areas of neutron science

neutrons4europe.com





Summary and Outlook

Major Goal for the Science Directorate 2019

“Begin installation of instruments” achieved

TA's for 6 more instruments approved, i.e. now for 13 out of the 15

Bunker installation starting this week

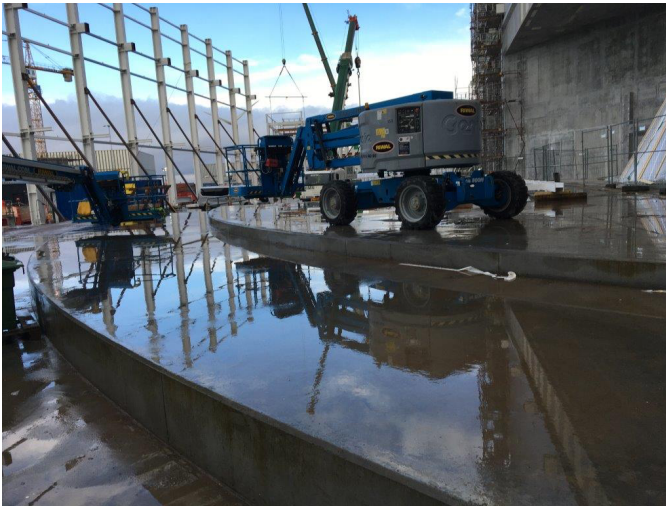
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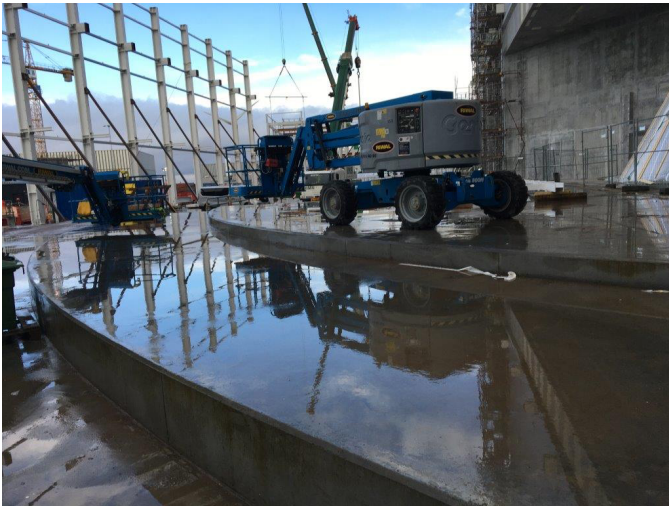
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2020:

Initial Operations replanning,

continue Installation in E-Buildings,

Move into E-Building Science and NSS/TD,

User meeting in September

