HOW TO MANUFACTURE AND VERIFY VACUUM COMPONENTS

Adam Wikström, Big Science Sweden

Wednesday nov. 4th 2026 at Texor AB in Lycksele
ONLINE participants: 12:00-15:00

Big Science Sweden

Vetenskapsrådet Swedish Research Council
VINNOVA Sweden's Innovation Agency

Big Science för Västerbotten

tillväxtverket
region västerbotten
big science sweden

AGENDA

Big Science för Västerbotten

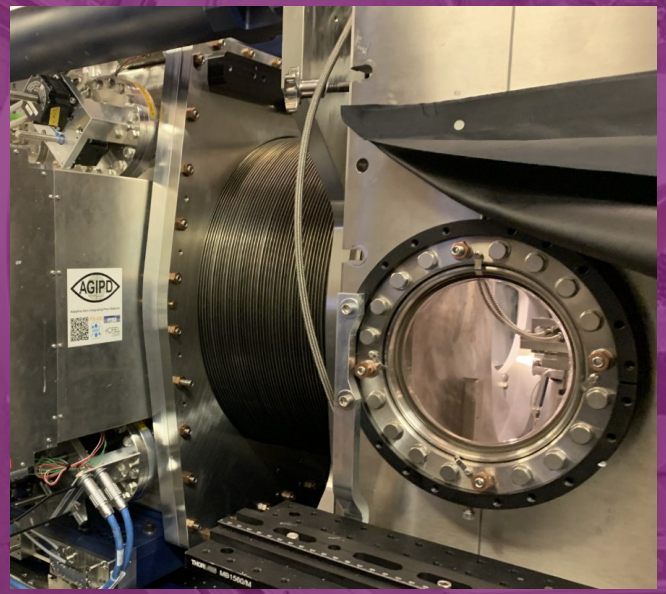
- *11:00-12:00 Lunch*
- 12:03-12:10 About our host Texor AB, *Jon Gerbrand, Texor AB*
- 12:10-12.25: Vacuum technology in Big Science and elsewhere, *Adam Wikström, BiSS*
- 12:25-12:55, What is vacuum? *Fredrik Arrhén, RISE*
- 12:55-13:25, To manufacture for vacuum, *Mike Olsson, BiSS*
- 13:25-14:10, Control and verification of vacuum systems, *Fredrik Arrhén, RISE*
- 14:10-14:25, Coffee break
- 14:25-14:45, Networks and cooperations in vacuum technology, *Fredrik Arrhén, RISE*
- 14:45-15:00, Opportunities for cooperations with LTU in aerospace and related areas
  Anna Öhrvall Rönnbäck, LTU, Olle Persson, LTU
- *15:00-16:00, Discussion and tour in Texor facilities – ON SITE ONLY!*

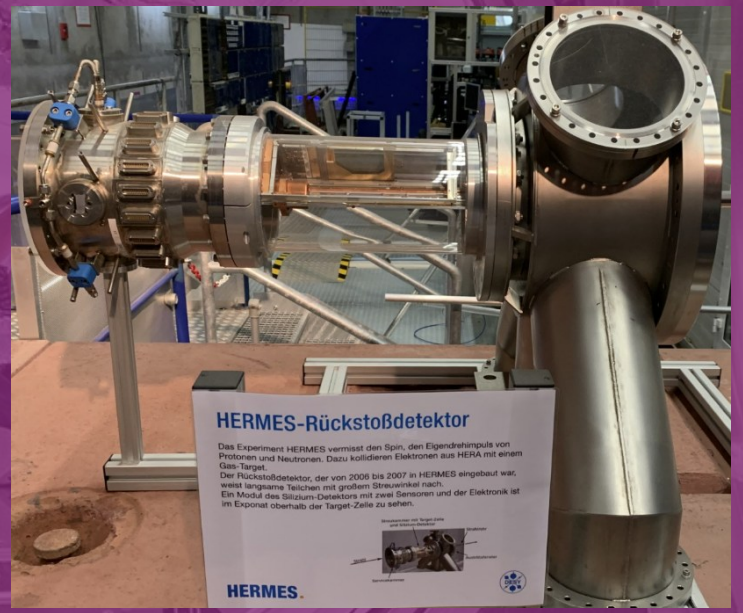
Big Science Sweden

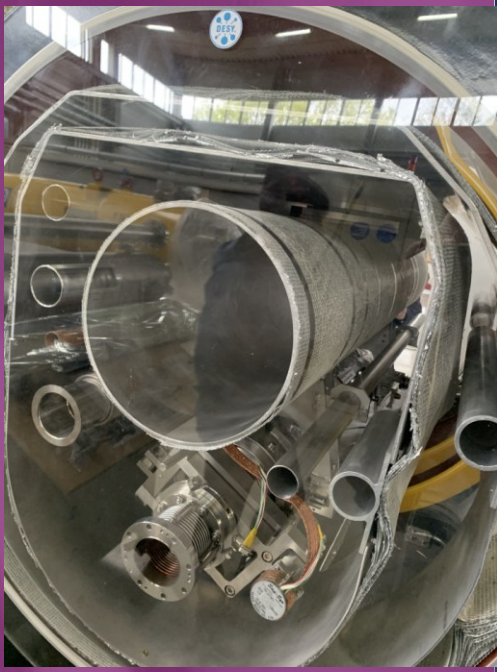
VACUUM TECHNOLOGY IN BIG SCIENCE AND ELSEWHERE

Examples from BSBF 2026, FAIR and elsewhere















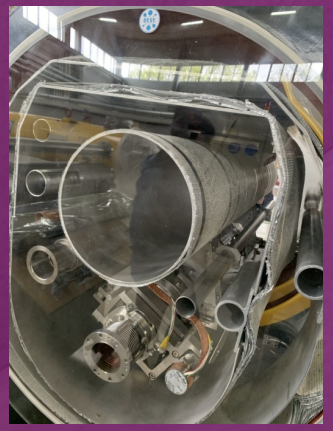


IMPORTANT COMPONENTS IN PARTICLE ACCELERATORS

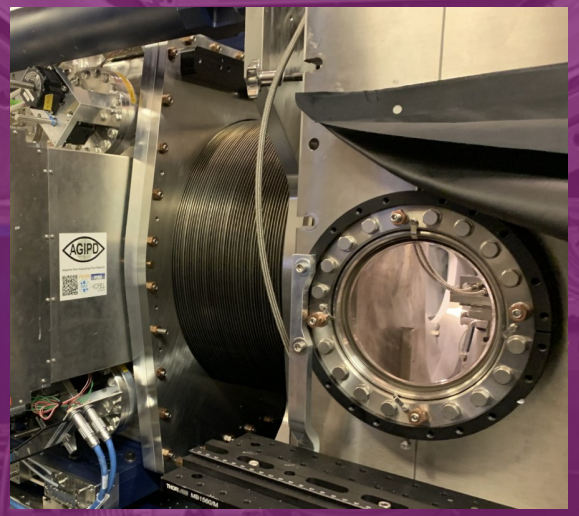
Used in MAXIV, XFEL, ESRF (X-ray camera facilities)
ESS, ISIS, DONES, (ILL) (neutron camera facilities)
CERN, FAIR (fundamental particle/materials research facilities)

- **Cryostats**
  Chambers used to keep things at low temperature using vacuum as insulation
  (things = magnets, superconducting wires, instruments…)

Cut-out of Cryostat for beamline showing the pipe for the beam and He cooling pipes
(also magnets and cavities)



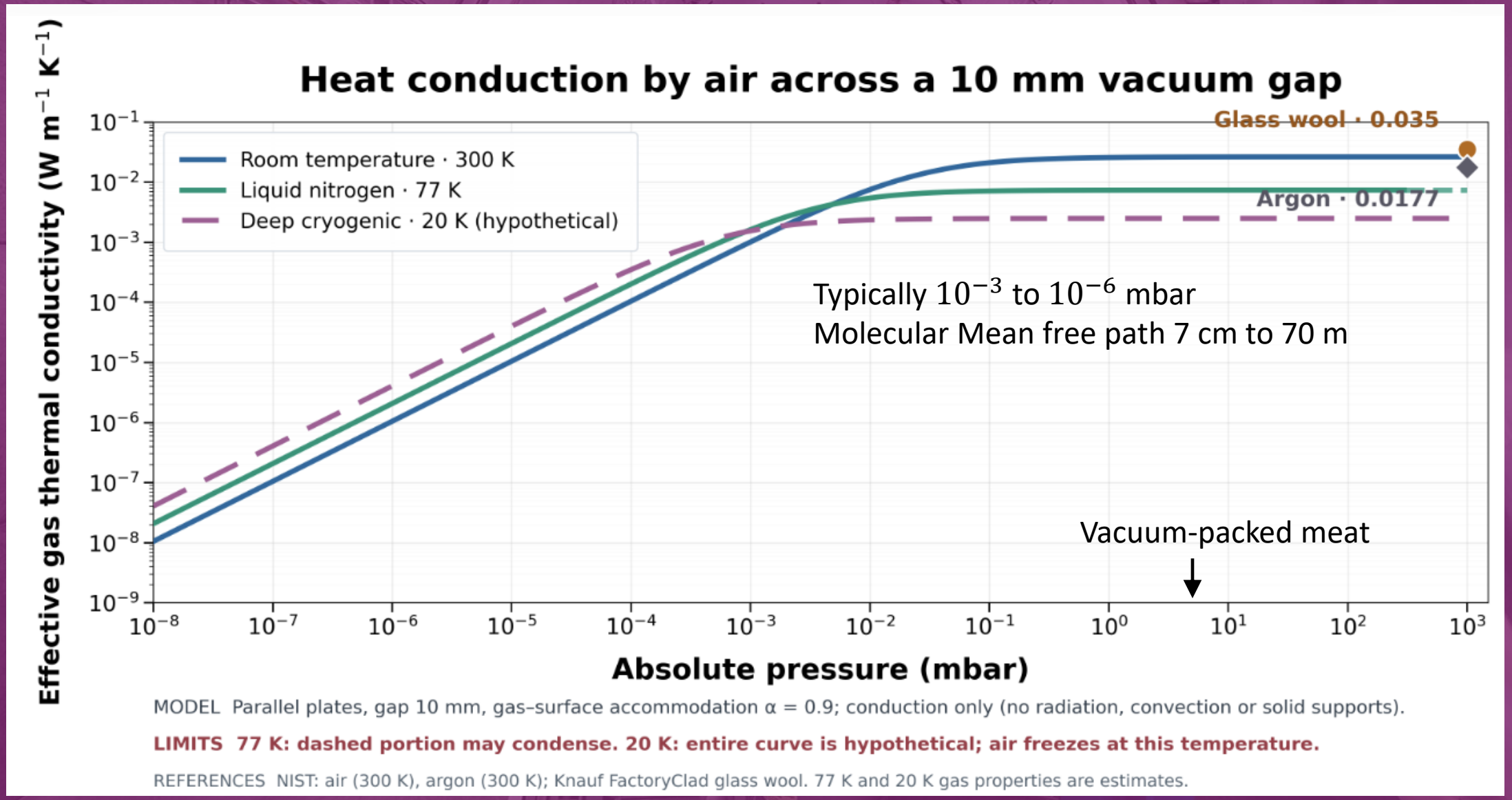
Bellows and instruments also often in/for vacuum



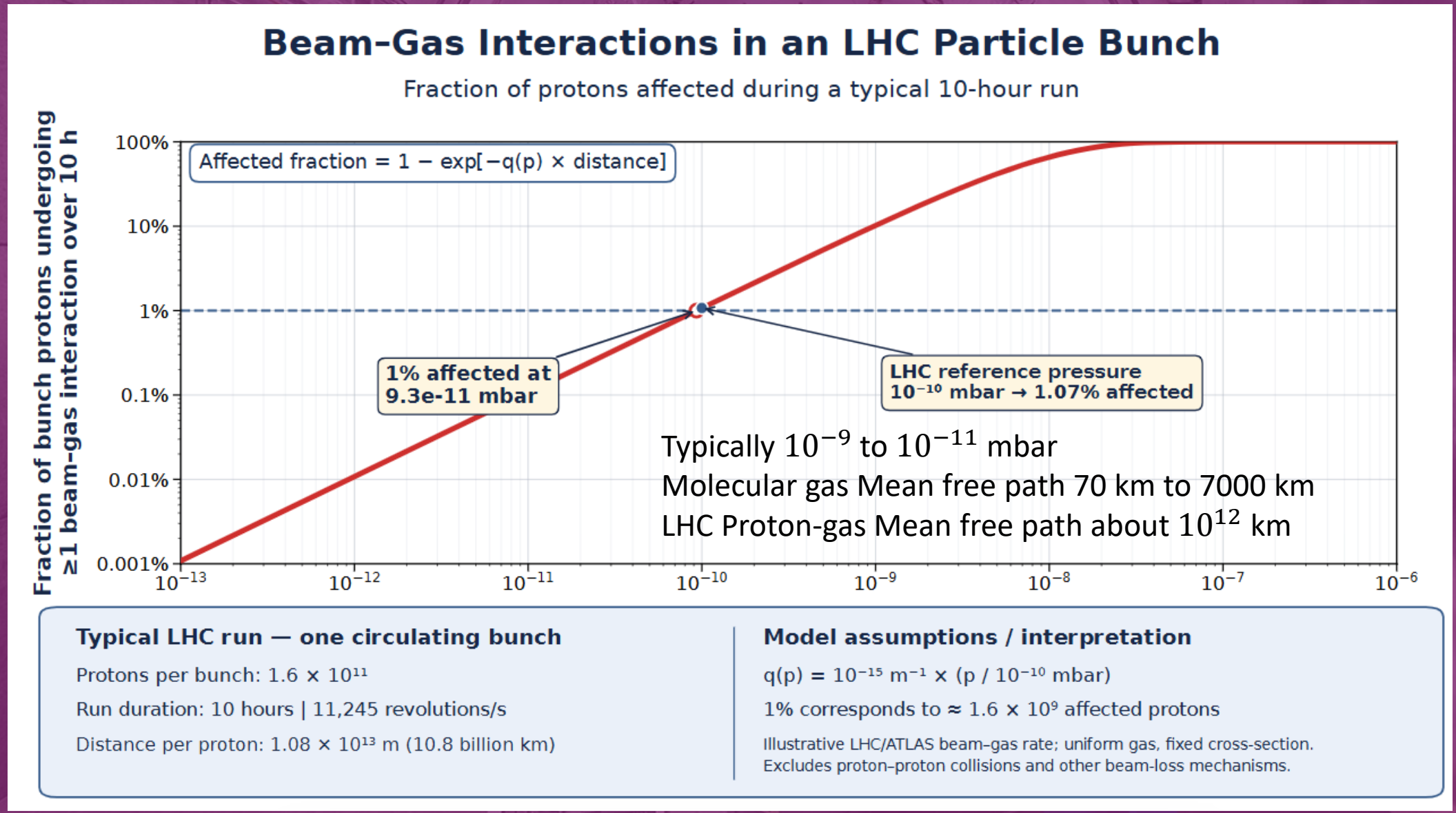
Cryostat to connect superconducting cables delivered by **RFR Solutions** and **Uppsala University** (-250C)



VACUUM OFTEN USED AS INSULATION



VACUUM TO AVOID PARTICLE COLLISIONS



IMPORTANT COMPONENTS IN TELESCOPE FACILITIES

Used at ESO, SKAO, EST

- ESO (European Southern Observatory, optical telescope):
  Mirror coating plants, Cryostats for detector and sensor cooling
- SKAO (Square Kilometer Array, radio telescope):
  Reciever cooling in vacuum vessels to minimize thermal noise
- EST: (European Solar Telescope):
  Minimize air turbulence and preserve optical image quality

FUTURE REFERENCES

- Cryostat design (CERN): Document on Cryostat design from CERN
- ESS Vacuum handbook 1: General Requirements for the Vacuum System.pdf
- ESS Vacuum handbook 2: Vacuum Equipment Standardization
- ESS Vacuum handbook 3: Vacuum Design and Fabrication
- ESS Vacuum handbook 4: Helium Leak Test
- RISE National Metrology Institute: Riksmätplatser
- ITER Vacuum handbook: Full vacuum handbook
- CERN: Introduction to the physics of vacuum technology

Big Science Sweden

Vetenskapsrådet Swedish Research Council

VINNOVA Sweden's Innovation Agency

Big Science för Västerbotten

tillväxtverket

region västerbotten

big science sweden