

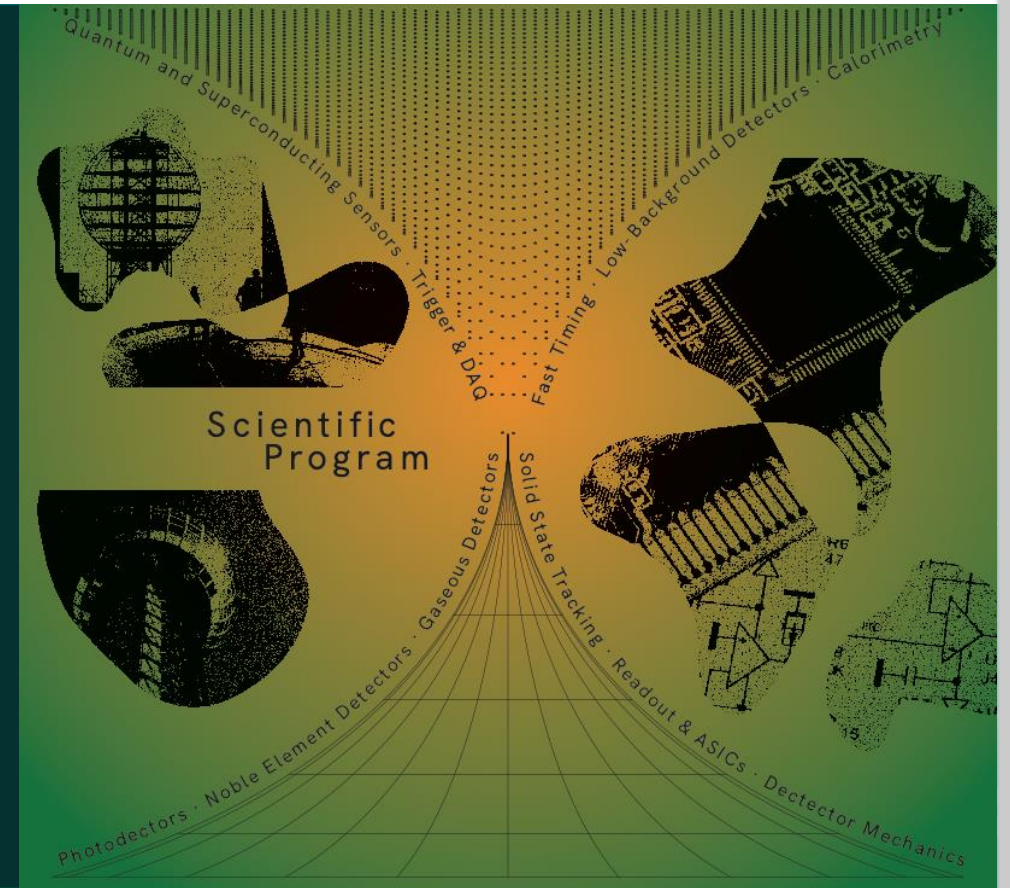
Welcome!

CPAD Participants

Marcel Demarteau
Physics Division

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ORNL is managed by UT-Battelle, LLC for the US Department of Energy

Workshop a partnership between UT Knoxville and ORNL



Mathieu Benoit (ORNL)

Friederike Bock (ORNL)

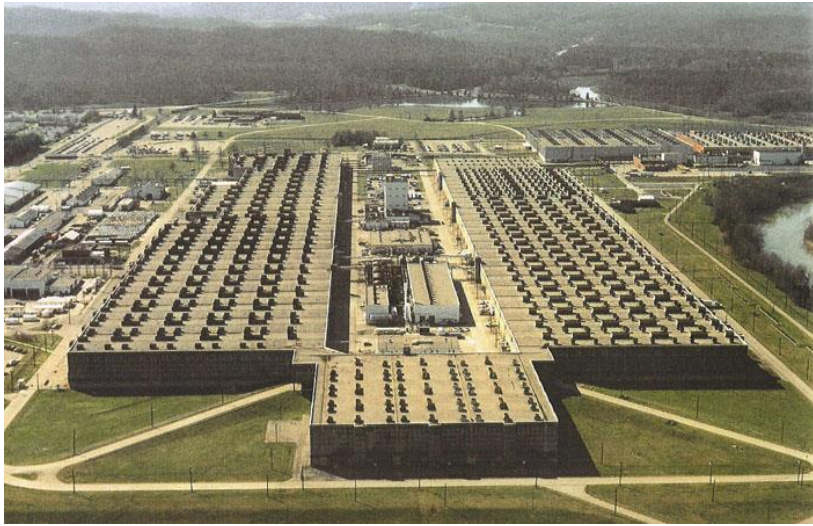
Oskar Hartbrich (ORNL)

Tova Holmes (UTK)

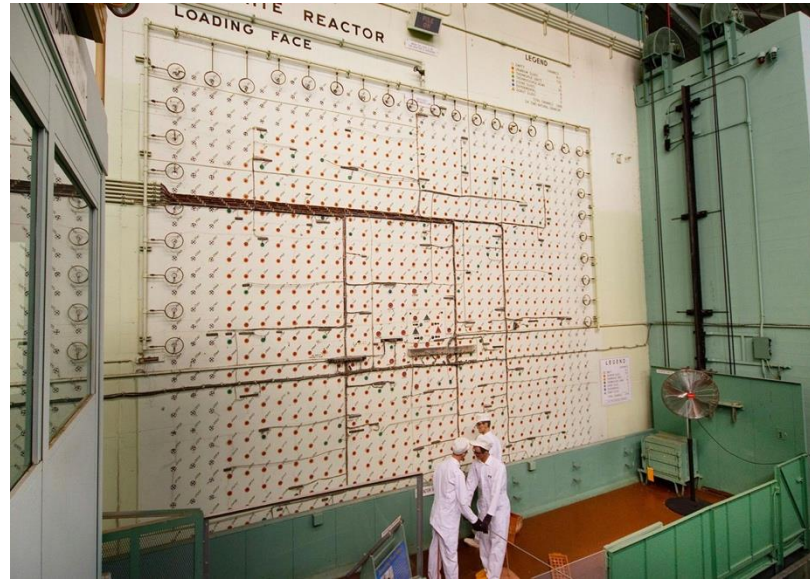
Lawrence Lee (UTK)



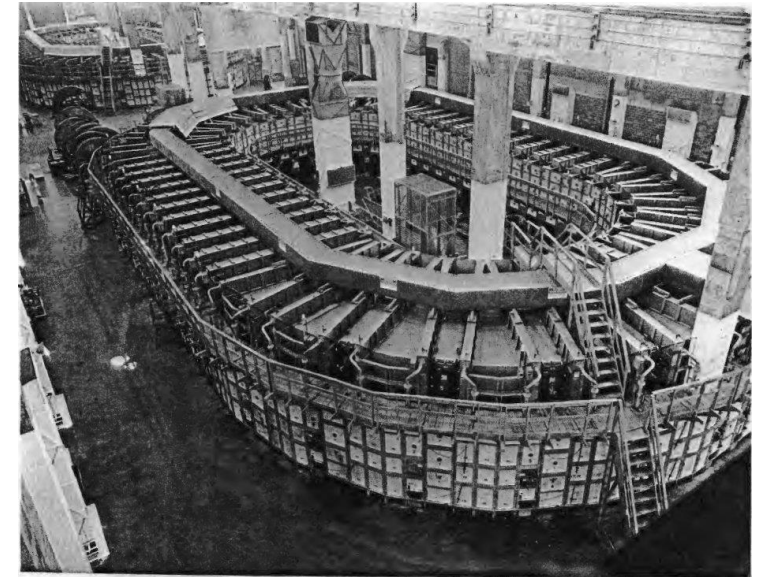
Oak Ridge National Laboratory evolved from the Manhattan Project



K25 – Gaseous Diffusion Plant for U-235 enrichment



X10 – Graphite Reactor; first production of gram-sized samples of Plutonium



Y12 – Electromagnetic Isotope enrichment through Calutrons

X10 became Oak Ridge National Laboratory (1947)

Oak Ridge – University of Tennessee Partnership leads nation in post-war transition of labs to fundamental science



The Clinton Pile (aka – the Graphite Reactor) was the world's first continuously operated nuclear reactor



Clifford Shull and Ernest Wollan pioneered neutron diffraction using the Graphite Reactor

University of Tennessee provided graduate programs for Manhattan project scientists.

Continuing Partnership



THE UNIVERSITY OF
TENNESSEE
Oak Ridge
Innovation Institute

<https://utorii.com>



Jillene Sennon-Greene
Radioisotope
Manufacturing Coordinator

ORNL's distinctive user facilities bring thousands of R&D partners to the lab each year

Building Technologies
Research and Integration Center



Manufacturing
Demonstration Facility



Carbon Fiber
Technology Facility



National Transportation
Research Center



Center for Nanophase
Materials Sciences



Oak Ridge Leadership
Computing Facility



High Flux Isotope Reactor



Spallation Neutron Source



Oak Ridge Physics Division: Home to Two Historic Sites

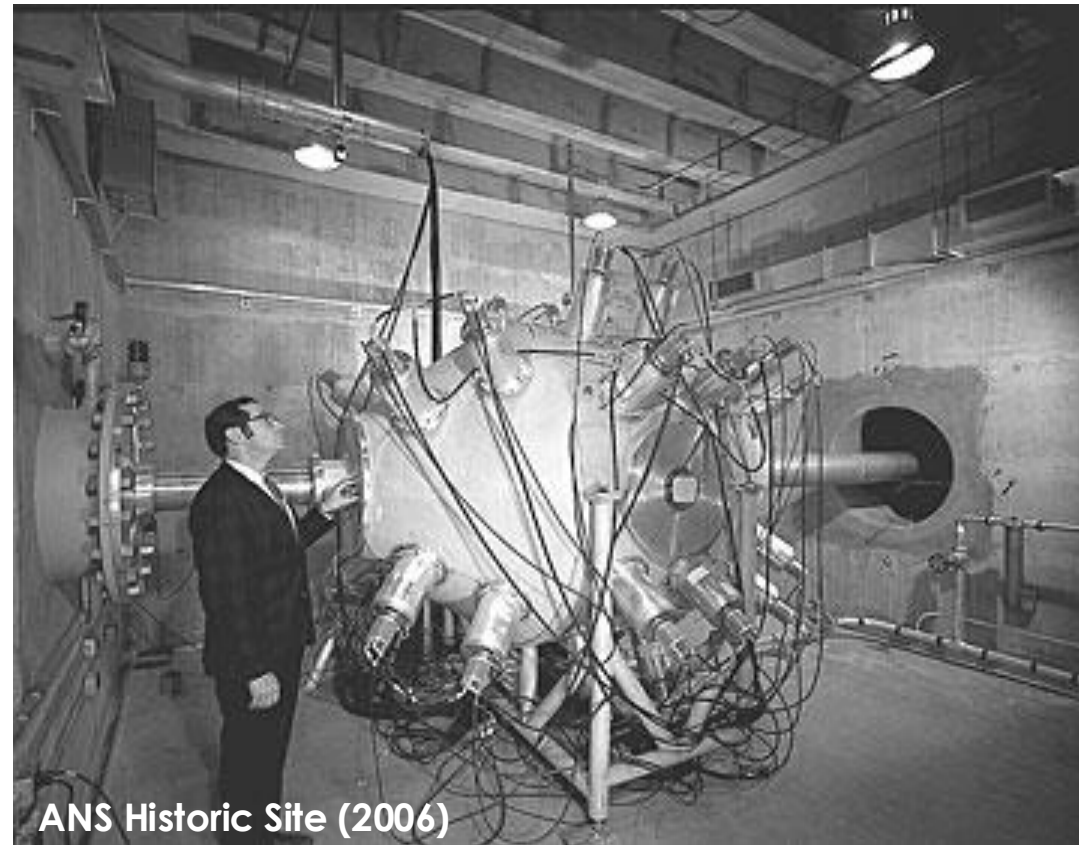
Holifield Radioactive Ion Beam Facility



APS Historic Site (2016)

HRIBF carried out pioneering experiments using accelerated beams of radioactive nuclei (1963 – 2012)

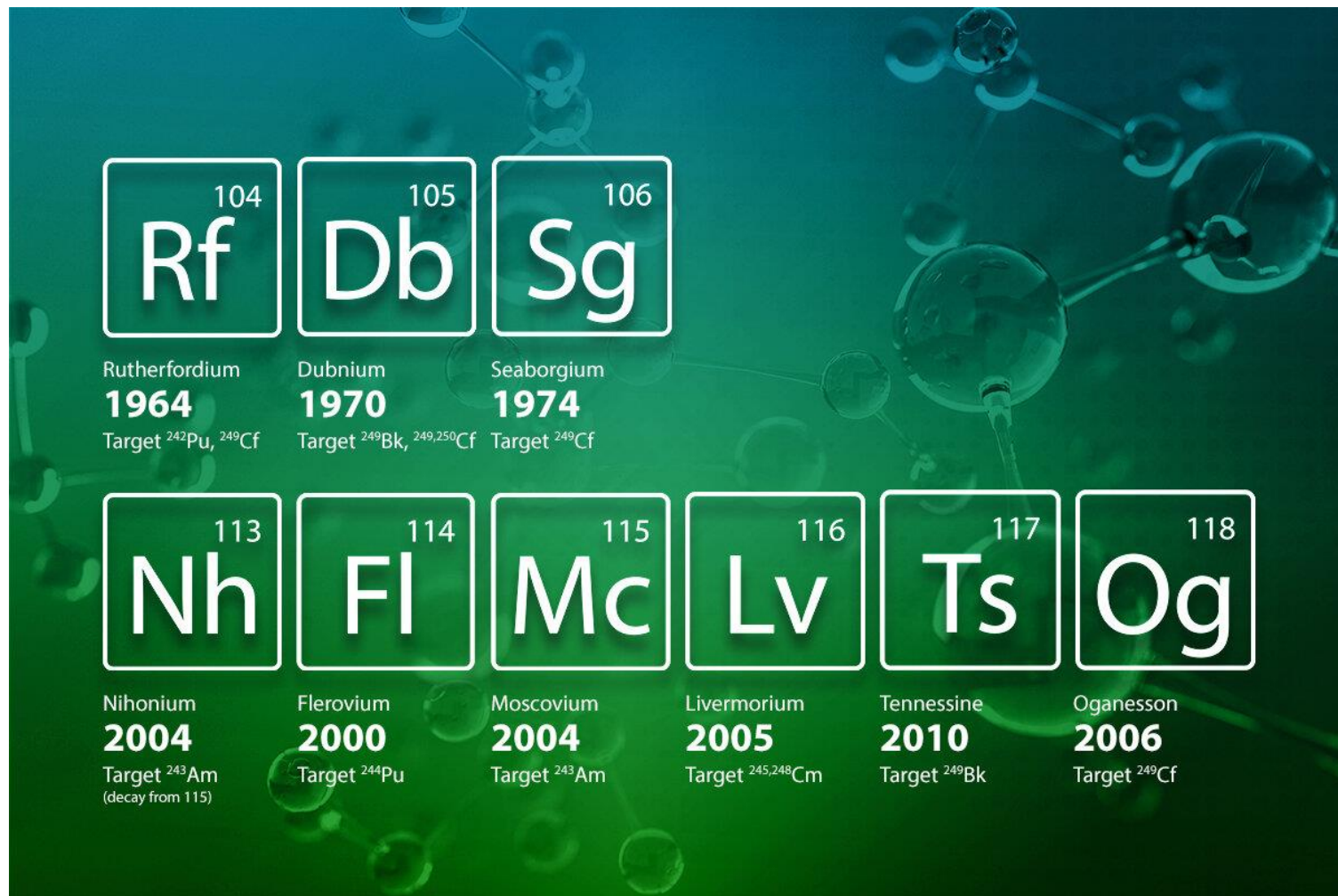
Oak Ridge Electron Linear Accelerator



ANS Historic Site (2006)

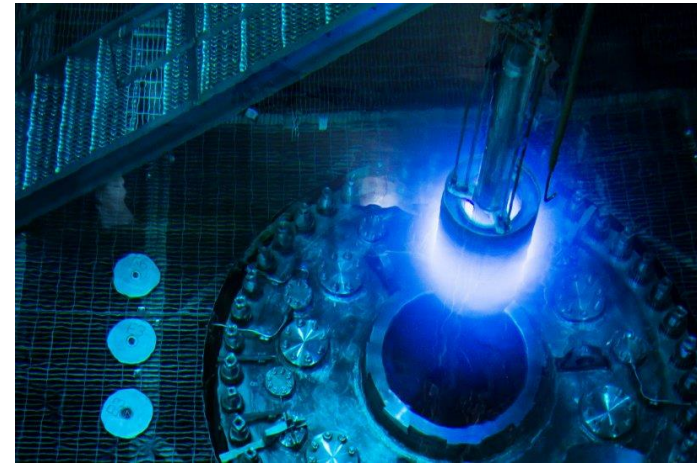
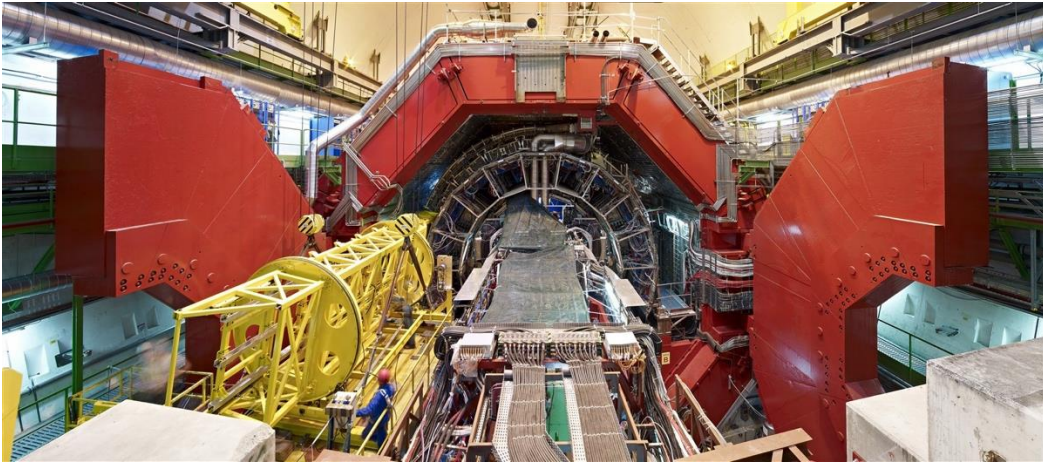
ORELA's linear accelerator became the world's leading facility for producing nuclear data (1969 – 2015)

Oak Ridge Physics Division



- Oak Ridge contributed to and participated in the discovery of nine superheavy elements.
- Element 117 named after the state.

Oak Ridge Physics Division



- Hosting only reactor neutrino experiment in US (HFIR)



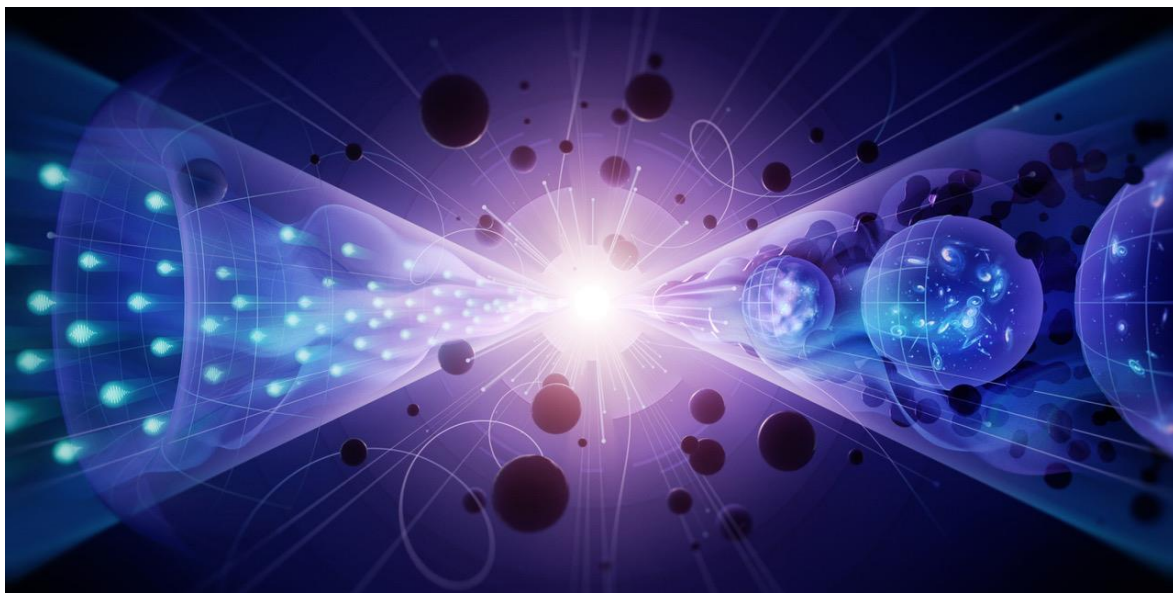
- Built the lead-scintillator shashlik electromagnetic calorimeter for ALICE (LHC)
- Lead lab for the Majorana Demonstrator $0\nu\beta\beta$ -decay experiment (SURF)



- Discovered coherent elastic neutrino nucleus scattering (SNS)

Strategic Plans

Exploring the Quantum Universe



Pathways to Innovation and Discovery
in Particle Physics

*Particle Physics Project Prioritization Panel (P5)
2023*

A New Era of Discovery



*Nuclear Physics Long Range Plan
2023*

Incomplete, Resolved by Experiment



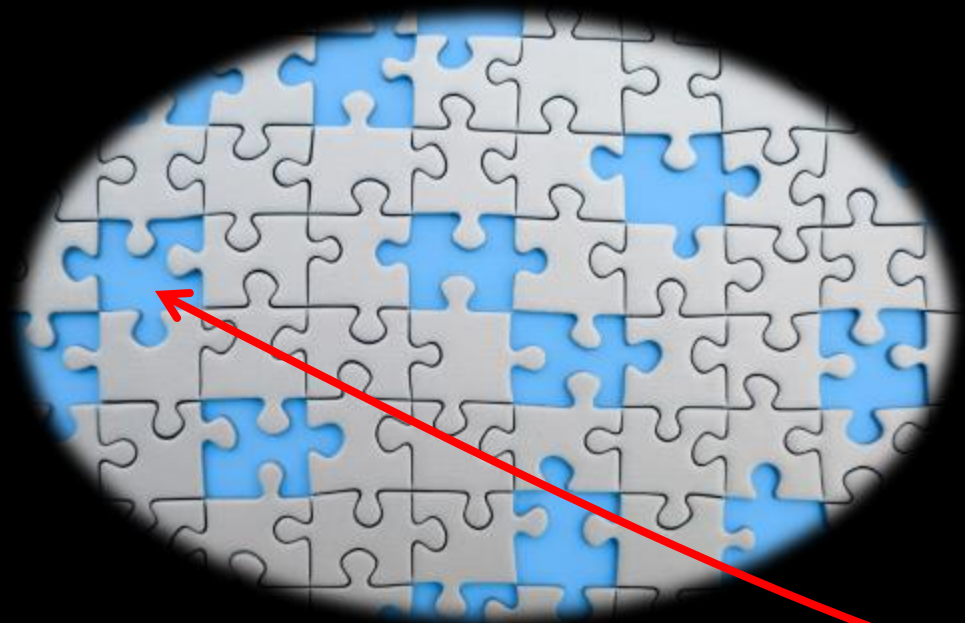
Incomplete, Resolved by Experiment



Theories



Incomplete, Resolved by Experiment

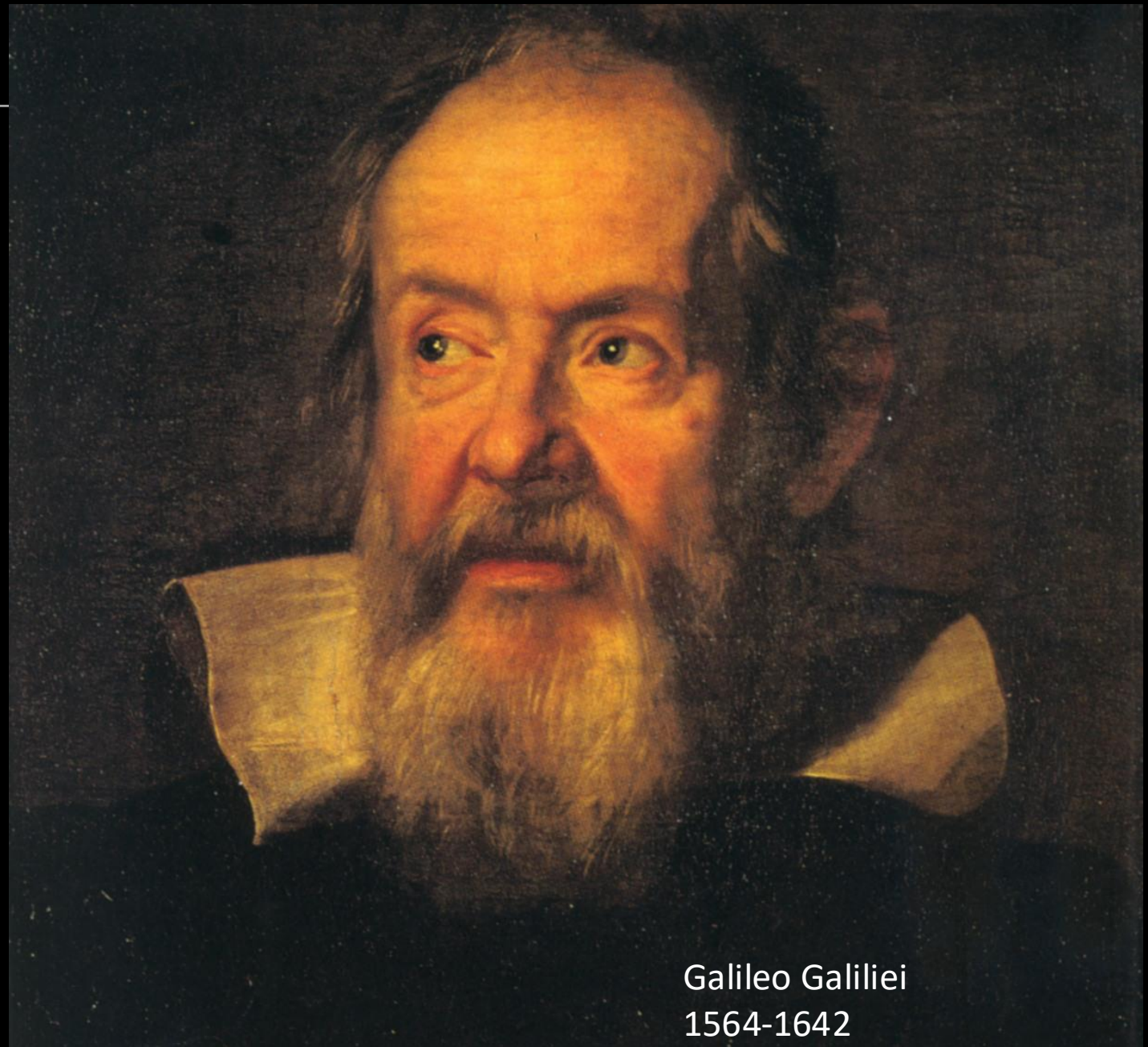
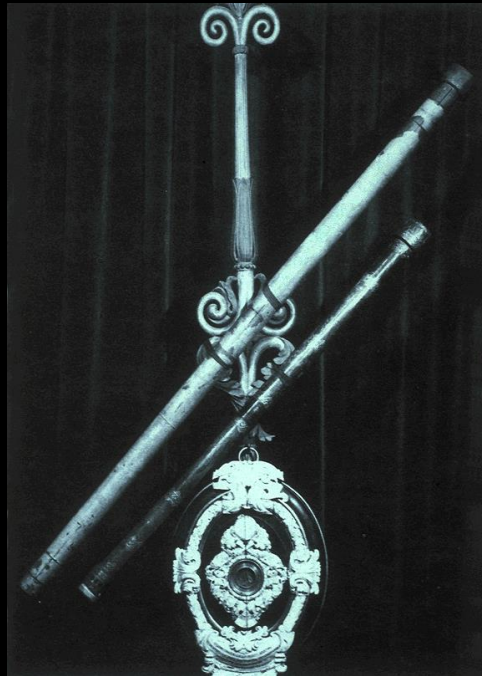


Theories



Experiment
(with highest sensitivity
and novel techniques)

“Measure what is measureable and
make measureable what is not so.”



Galileo Galilei
1564-1642

Thank you

and have a great Workshop!