



Strategy Report on Research Infrastructures
ROADMAP 2021

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Landscape Analysis for PSE on ESFRI Roadmap 2021

- Gives the context, in each domain, of the operational national or international research infrastructures open to European scientists and technology developers through peer-review of competitive science proposals.
- Identifies the existing resources, the gaps and the potential evolution of each field in the foreseeable future.
- Responds to the invitation by the Council for ESFRI to broaden its view beyond the Roadmap list of projects and to consider the whole Research Infrastructure system in Europe.
- Produced by the six ESFRI Strategy Working Groups (SWGs) composed of well-recognized scientists in each domain.
- *Note that the Landmark Analysis does not imply any level of decision or engagement by ESFRI in prioritizing future solutions, nor does the content necessarily reflect the view of ESFRI Members. ESFRI in no case acts as an advocate of specific potential future projects.*



Landscape Analysis for PSE on ESFRI Roadmap 2021

Landscape Analysis are to:

- Provide a survey on major transnational RI in PSE offering Open-Access to researchers, support staff, education and research institutions, business industries and public services mostly based in quality peer review system.
- Keep track of the developments and trends for PSE from thematic roadmaps and strategy papers.
- Understand the complementarity and effectiveness of interfaces between RI, inside PSE and also across others SWG areas.
- Provide an overview for PSE of the European RI ecosystem enabling ESFRI Forum to fulfil its strategic and incubator roles.
- Enable ESFRI Forum to identify gaps in the European RI landscape for PSE and promote inter and cross disciplinary aspects.
- Help the involved administrations (based on variable geometry approach) to position their RI in the global RI landscape of PSE.
- Update, confirm and reinforce evidences on the overall value and sustainability issues of the operational RI in PSE.
- **The LA is “already” an strategic document highly appreciate by the community and the RI**



ESFRI PROJECTS

DIGIT

ENE

ENV

H&F

PSE

SCI

EU-SOLARIS

MYRRHA

WindSanner

AnaEE

ISBE

MIRRI

2010

ACTRIS

DANUBIUS-RI

EMPHASIS

EST

KM3NeT 2.0

E-RIHS

2016

IFMIF-DONES

DiSSCo

eLTER

EU-IBISBA

METROFOOD-RI

EHRI

2018



ESFRI LANDMARKS

DIGIT

ENE

ENV

H&F

PSE

SCI

PRACE

JHR

EMSO ERIC

BBMRI ERIC

ELI

CESSDA ERIC

EURO-ARGO ERIC

EATRIS ERIC

ELT

CLARIN ERIC

IAGOS

ECRIN ERIC

ESS ERIC

DARIAH ERIC

ICOS ERIC

ELIXIR

European XFEL

ESS ERIC

LifeWatch ERIC

INFRAFRONTIER

FAIR

SHARE ERIC

INSTRUCT ERIC

ILL

SKA

SPIRAL2

2006

ECCSEL ERIC

EISCAT_3D

EMBRC ERIC

CTA

EPOS ERIC

ERINHA

EMFL

EU-OPENSOURCE ERIC

Euro-Biolmaging

2008

ESRF EBS

HL-LHC

2016



Landscape Analysis for PSE on ESFRI Roadmap 2021

- Landscape Analysis in PSE identify 3 working sub-areas and it will explore a fourth one.

The 3 sub-areas are:

- Astronomy and Astro-particle Physics
- High Energy and Nuclear Physics
- Analytical Physics

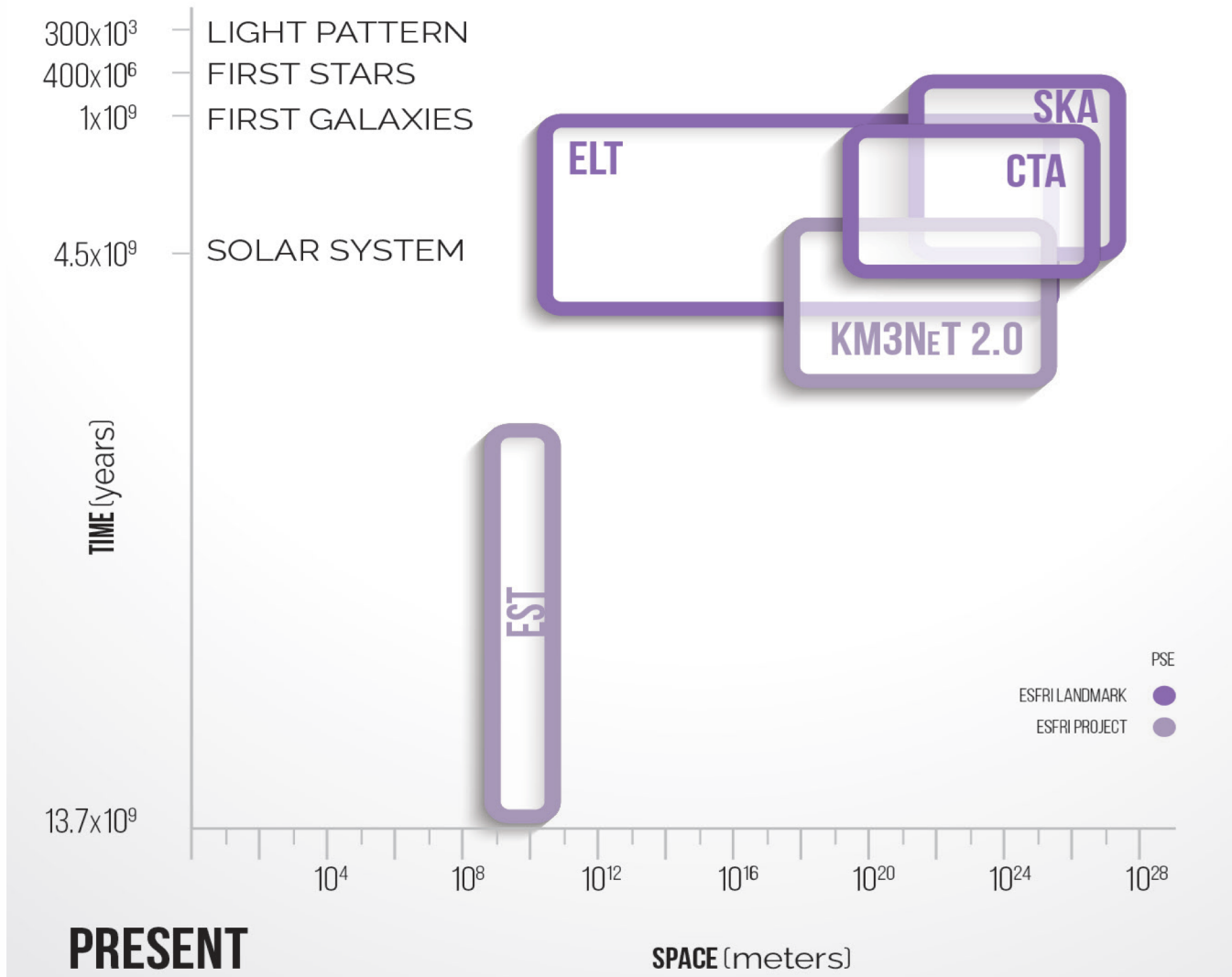
A new sub-Area will be explored for:

- Science of Engineering RI (difficult to identify examples, with the definition of ESFRI for RI) and not to interference with other focused SWG (Environment, Energy, Health & Food, Data...)



Landscape Analysis for PSE on ESFRI Roadmap 2018

BIG BANG



Landscape Analysis for PSE on ESFRI Roadmap 2018

GROUND-BASED TELESCOPES

GAMMA RAY

HESS MAGIC CTA

VISIBLE/INFRARED

LSST ELT VLT

RADIO

ALMA VLBI-JIVE SKA
LOFAR-ILT

NEUTRINO

KM3Net 2.0 IceCube

SOLAR

EST

SPACE-BASED TELESCOPE

VISIBLE

HUBBLE KEPLER EUCLID
PLATO

INFRARED/SUB-MILLIMETRE

WEBB/JWST

X-RAY

ATHENA

SOLAR SYSTEM

Solar Orbiter BepiColombo
Exomars Juice

GRAVITATIONAL WAVES INTERFEROMETERS

GROUND- AND SPACE-BASED

LIGO VIRGO KAGRA INDIGO LIGA

**Sub-Area: Astrophysics
and Astro-particles
Physics.
Multi-messenger
approach**



Landscape Analysis for PSE on ESFRI Roadmap 2018

PARTICLE PHYSICS

COLLIDERS

HL-LHC FNAL
FCC ILC

PLASMA WAKEFIELD ACCELERATORS

SACLAY STFC-Daresbury Uni-Glasgow
INFN-Frascati GSI DESY MPI-Munich ELI-Beamline

LHC Atlas, Alice, CMS FAIR RHIC NICA

LEPTON/PHOTON

COMPASS HIPA DAΦNE-INFN Frascati
MAX-lab ELI-NP ELSA MAMI

HADRON BEAMS

HIPA DAΦNE-INFN Frascati
COSY Antiproton decelerator-CERN GSI

HEAVY ION BEAMS

ESS JST GNAIL ALTO
ISOLDE SPIRAL2 ECT* FAIR-GSI
INFN-Legnaro JYFL SHE Factory

NUCLEAR PHYSICS

**Sub-Area:
High
Energy and
Nuclear
Physics**



ANALYTICAL FACILITIES

SYNCHROTRON RADIATION

ESRF PETRA III
ALBA Diamond MAX IV SOLEIL SLS
Elettra Bessy II SOLARIS ASTRID MLS

NEUTRON SCATTERING

ILL ISIS Orphée-LLB FRM-II/MLZ ESS
BER II SINQ JEPPII KJELLER
BNC RI-Delft RPI-Sacavem REZ
VIENNA REACTOR

HIGH PERFORMANCE LASERS

ELI PFS-Petawatt NFFA-SPRINT
ARTEMIS FORTH CFEL T-REX
Laser Majoule HiPER Vulcan

FREE-ELECTRON LASERS

European XFEL Swiss-FEL FERMI@Elettra
FLASH CLIO FELBE FELIX TARLA

OUTSIDE EUROPE
SACLA LCLS PAL

ELECTRON MICROSCOPY

Juelich Harwell
SuperSTEM-Daresbury LPS-Orsay

OUTSIDE EUROPE
SACLA LCLS PAL

HIGH MAGNETIC FIELDS

EMFL

OUTSIDE EUROPE
WHMFC HHMFL NHMFL-MagLab

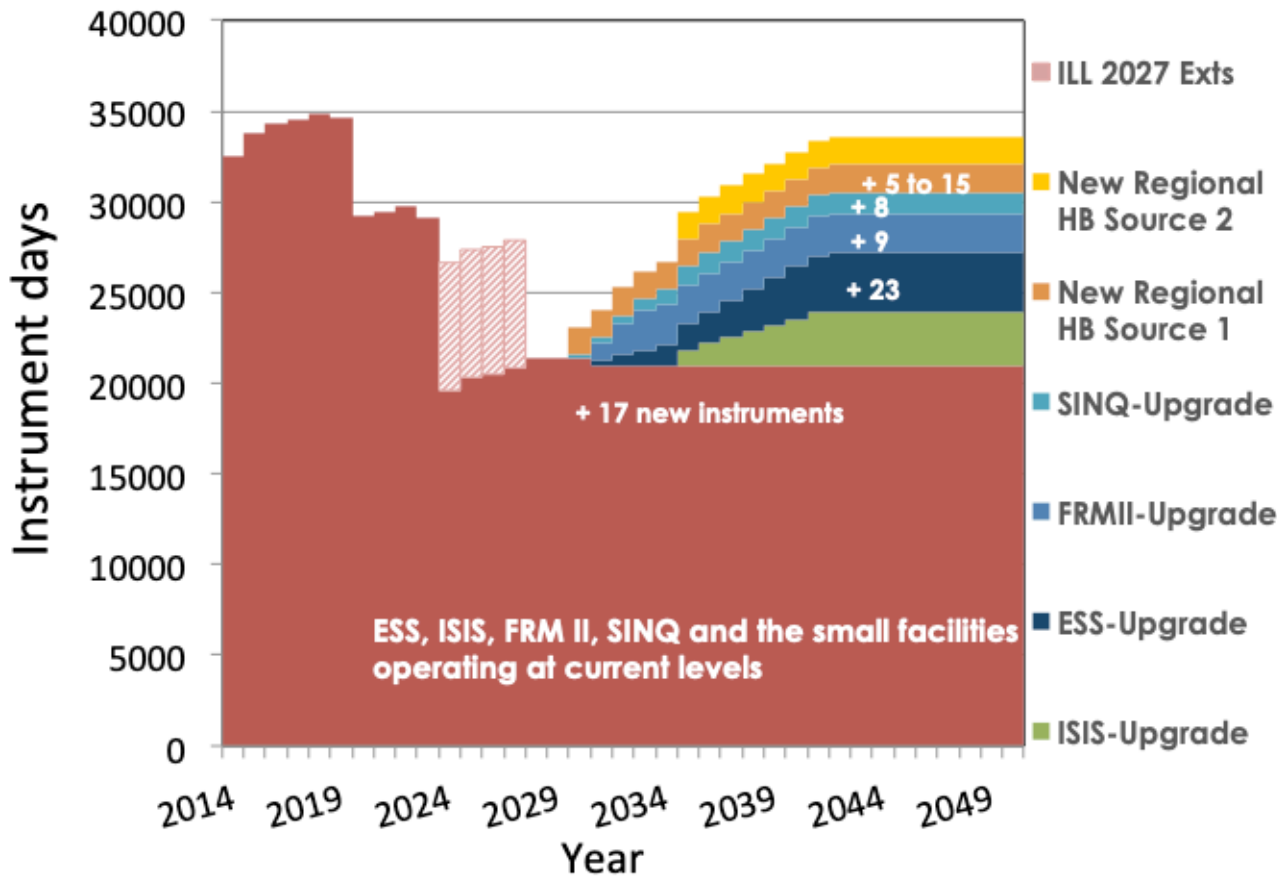
**Sub-Area:
Analytical
Facilities**



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Results Ad-Hoc working group on the Future of Neutrons in Europe:

https://www.esfri.eu/sites/default/files/NGL_CombinedReport_230816_Complete%20document_0209-1.pdf



See C. Petrillo et al.



Landscape Analysis for PSE on ESFRI Roadmap 2021

Now new “animals” appear in the Land scape:

**Before we have “Research Associations” or equivalents:
NuPECC, Astronet, ESO and CERN**

Now the new elements as: LEAPS (Synchrotron) and LENS (Neutron) a mixture of Association of Facilities and users, not totally defined not separated, that request direct bilateral dialogue with the MS/AC and EU and they propose to “organize” their respective areas (coordinate efforts, investments, people, priorities) and Co-funding mechanisms

Not clear how this initiatives will evolve in the near future





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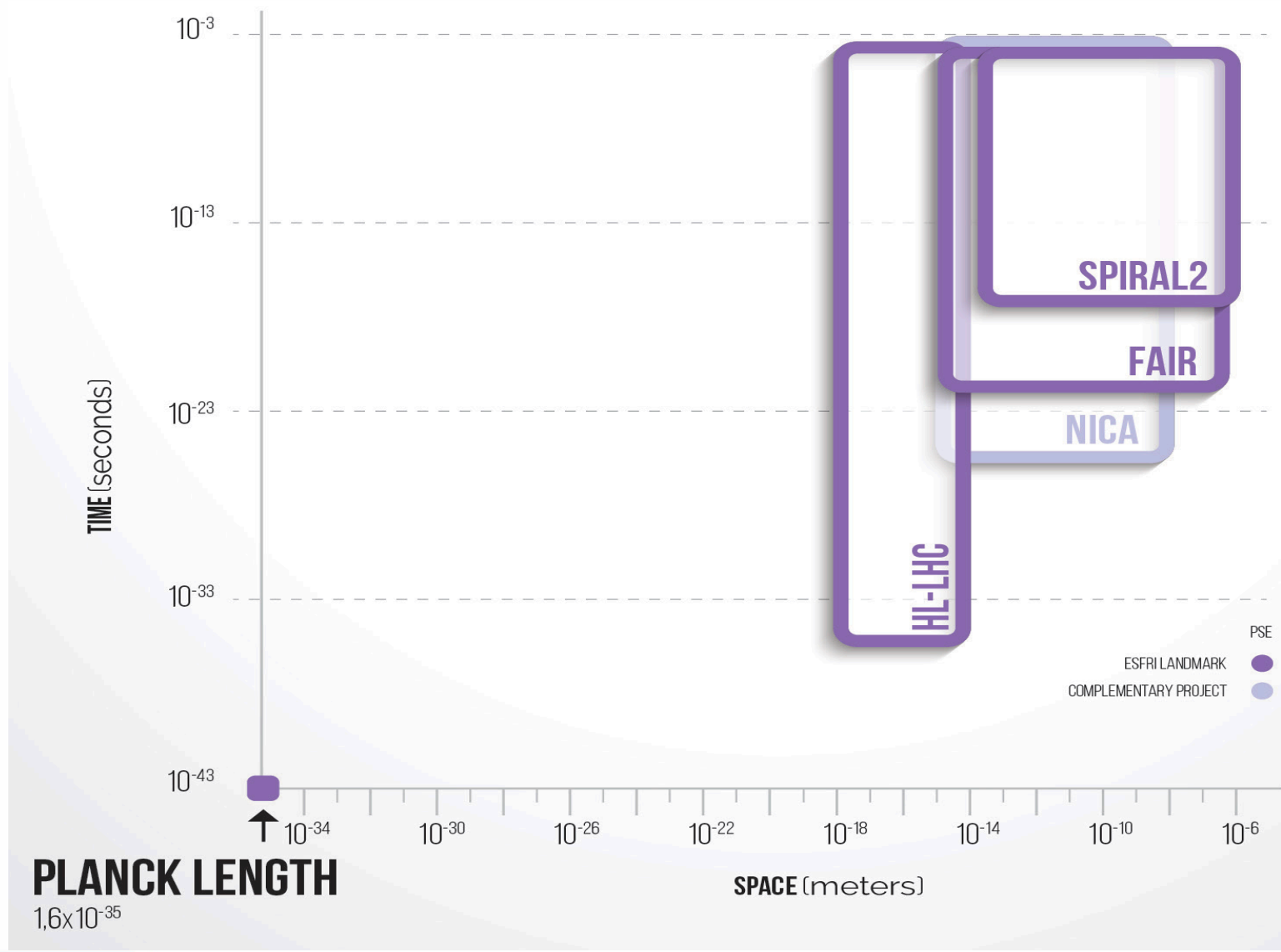
Thank you for the
attention!

ESFRI

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