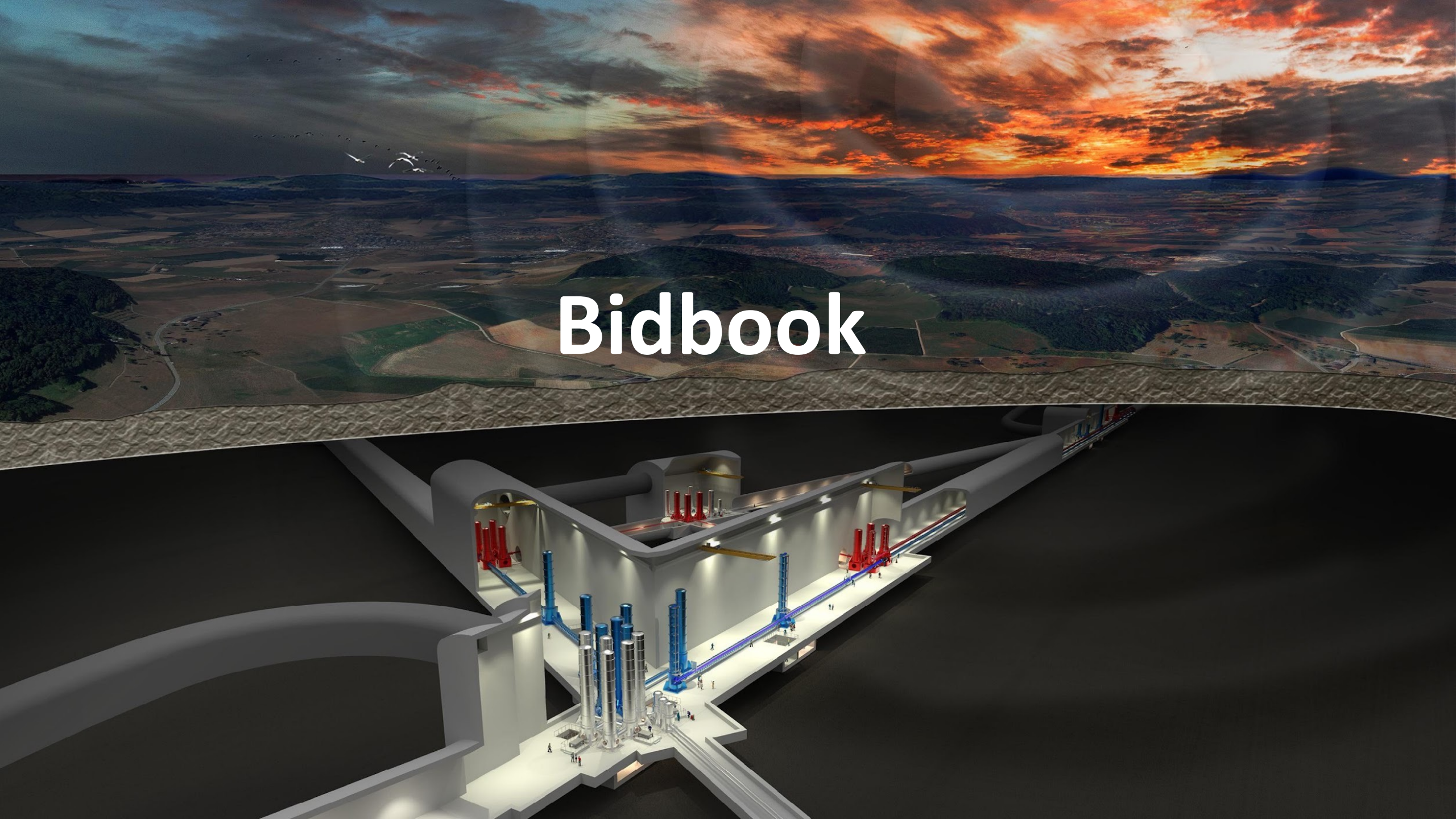
# Next Steps: discussion about SPB/SCB working strategy and organization

W. Walk & D. D'Urso

ET-PP INFRA-DEV Annual Meeting , 12th- 13th June 2023, Barcellona



# Bidbook

# SPB Mandate

- Site Characteristics
  - ❑ Physical variables
  - ❑ Geological, geophysical and geotechnical information
  - ❑ Costs and timing
  - ❑ Legal aspects and site quality preservation
  - ❑ Socio-economic-environmental impact
  - ❑ Risk Assessment
  - ❑ **Bidbook: standard, monitoring and collecting**

# Bidbook content

Chairs: Tomek Bulik, Rosario De Rosa (Sardinia) and Martijin Rumpen (EMR)

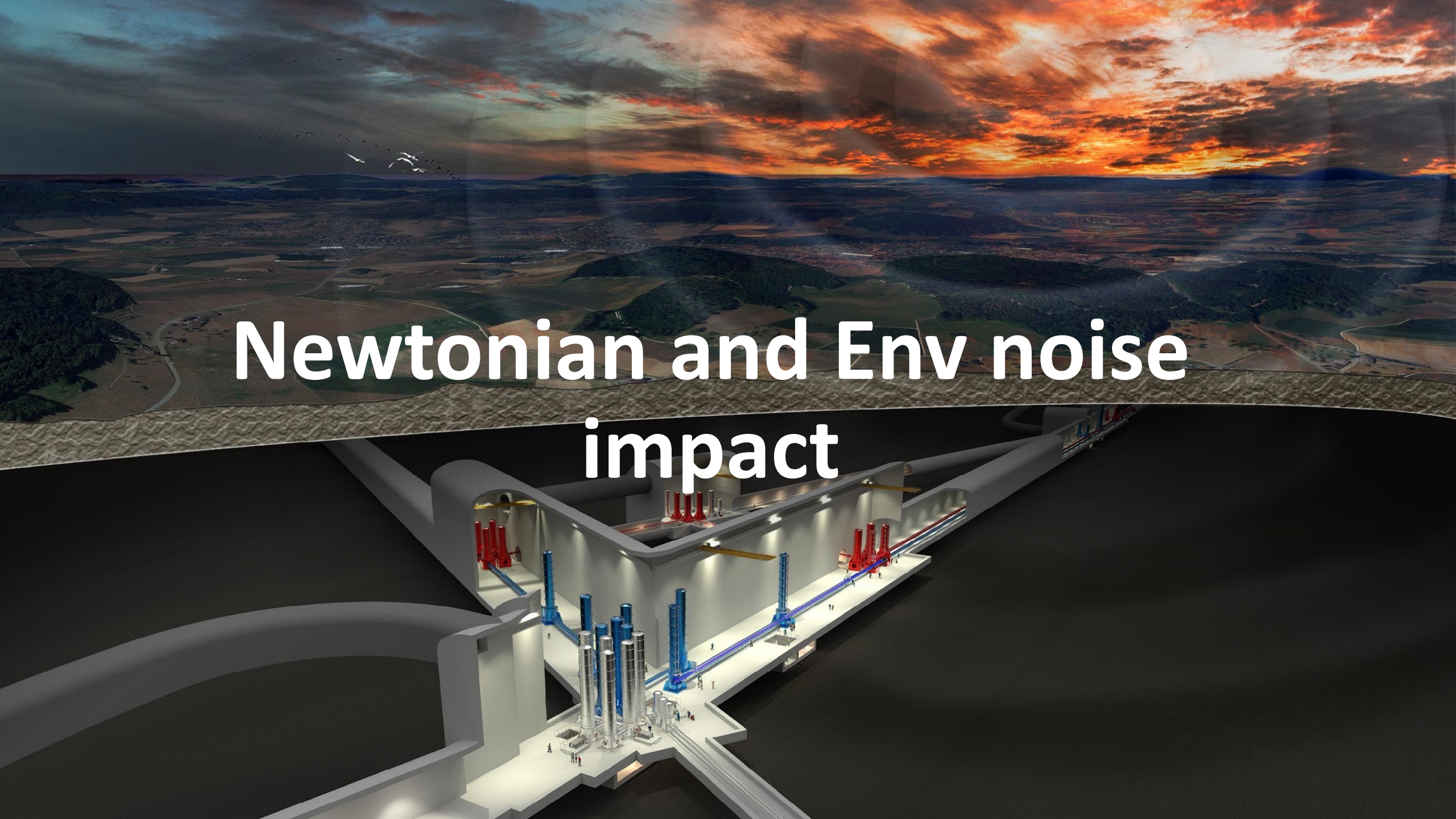
- the needed legal documentation
- the procedures to realize the ET infrastructure
- the timing
- the cost according the evaluations of the infrastructure team, of the collaboration (for the detectors) and of the Host Teams for what concerns the specific costs
- the financial plan distinguishing the infrastructure from the detectors
- the site related risk assessment
- the socio-economic impact
- The environmental impact
- The scientific performance according to the standards defined by the collaboration
- …

# Bidbook content

- **Common Template for scientific aspects!**
- Standards and best practices for site noise measurement and evaluation (ET Collaboration)
- Evaluation of site characteristics on ET performances (Host Teams and ET Collaboration)
- Site noise mitigation (ET Collaboration)
- Costs and timing (Host teams and PD/Project Dept./Infrastructures)
- Risk assessment
  - scientific -> ET Collaboration
  - Non-scientific -> PD

# Discussion evolution of SPB/SCB

- Split WD3 (bidbook) into two activities:
  - Collaboration will have responsibility on standards and coordinating with WD1/2 and other related ET Boards
  - ETO will take care of the formal bidbook processes (framework, communication with BGR, ...)
- Split WD4 (costs, schedules & risk ass.): risk related to scientific aspects will, mitigation strategy and so on will be under the responsibility of the Collaboration
- SPB/SCB chairs to report at regular meetings of ETO management



# Newtonian and Env noise impact

# WP4 Milestones

## Milestone name – Date (in months)/Lead Institution

- **M4.1 – M3/UW :** *Document detailing the site-specific characteristics that impact ET sensitivity and its duty cycle* ***=> REPORT*** — **Delivered**
- **M4.2 – M10/UW :** *Common methodology to estimate impact of site characteristics on ET sensitivity and operation and, if required, a scheme to compensate it* ***=> REPORT*** — **Not ready**

*(months from ET-PP start date, Sept. 1st)*

# Newtonian and Env noise impact

| | |
|---|---|
| 98 - Atmospheric NN model | *Mauro Oi* |
| 99 - NN at EMR | *Soumen Koley* |
| 100 - NN from underground groundwater | *Kentaro Somiya* |
| 101 - Newtonian Noise in ET: state of the art and beyond | |
| 102 - Glitches and NN @ Sardinia | |
| 103 - Schumann Res. amplification | |
| 104 - Train noise at Virgo and LIGO | |
| 105 - Acoustic NN noise based on the LNGS case | |

## Newtonian Noise: State of the art and future perspectives

Francesca Badaracco

INFN GENOVA

ET symposium 2023, Cagliari

# Newtonian and Env noise impact

| | |
|---|---|
| 98 - Atmospheric NN model | |
| 99 - NN at EMR | Soum |
| 100 - NN from underground groundwater | Kentar |
| 101 - Newtonian Noise in ET: state of the art and beyond | Francesca B |
| 102 - Glitches and NN @ Sardinia | Rosario |
| 103 - Schumann Res. amplification | Tatsuki |
| 104 - Train noise at Virgo and LIGO | Federic |
| 105 - Acoustic NN noise based on the LNGS case | Mariusz Suche |

## Publications about Terziet:

Class. Quantum Grav. 39 025008 (2022)

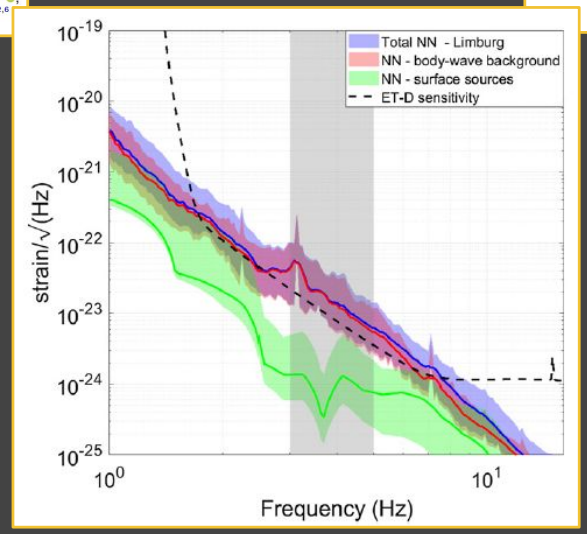
**Surface and underground seismic characterization at Terziet in Limburg—the Euregio Meuse–Rhine candidate site for Einstein Telescope**

Soumen Koley[1,2,*], Maria Bader[2], Jo van den Brand[2,3], Xander Campman[4], Henk Jan Bulten[2,5], Frank Linde[2,6] and Bjorn Vink[7]

Class. Quantum Grav. 39 025009 (2022)

**Newtonian-noise characterization at Terziet in Limburg—the Euregio Meuse–Rhine candidate site for Einstein Telescope**

Maria Bader[1,5], Soumen Koley[1,2,*], Jo van den Brand[1,3,5], Xander Campman[4], Henk Jan Bulten[1,5], Frank Linde[1,6] and Bjorn Vink[7]




See talk of Soumen Koley LINK

## Publications about Sos Enattos:

Class. Quantum Grav. 31 105016 (2014)

**Microseismic studies of an underground site for a new interferometric gravitational wave detector**

L Naticchioni[1,2], M Perciballi[2], F Ricci[1,2], E Coccia[3,4], V Malvezzi[3], F Acernese[5,6], F Barone[5,6], G Giordano[5], R Romano[5,6], M Punturo[7], R De Rosa[6,8], P Calia[9] and G Loddo[9]

The European Physical Journal Plus volume 136, Article number: 511 (2021)

**Seismic glitchness at Sos Enattos site: impact on intermediate black hole binaries detection efficiency**

A. Allocca[1,2], A. Berbellini[3], L. Boschi[3,4,5], E. Calloni[1,2,a], G. L. Cardello[6,7], A. Cardini[8], M. Carpinelli[6,7,9], A. Contu[8,10], L. D'Onofrio[1,2], D. D'Urso[6,7], D. Dell'Aquila[6,7], R. De Rosa[1,2], L. Di Fiore[2], M. Di Giovanni[11,12,13], S. Di Pace[14,15], L. Errico[1,2], I. Fiori[9], C. Giunchi[11], A. Grado[16], J. Harms[12], E. Majorana[14,15], V. Mangano[14,15], M Marsella[14,15], C. Migoni[8], L. Naticchioni[14,15], M. Olivieri[3], G. Oggiano[6,7], F. Paoletti[17], M. Punturo[18], P. Puppo[15], P. Rapagnani[14,15], . Ricci[14,15], D. Rozza[6,7], G. Saccorotti[11], V. Sequino[1,2], V. Sipala[6,7], . Tosta E Melo[6,7], L. Trozzo[2]

J. Phys.: Conf. Ser. 1468 012242 (2020)

**Characterization of the Sos Enattos site for the Einstein Telescope**

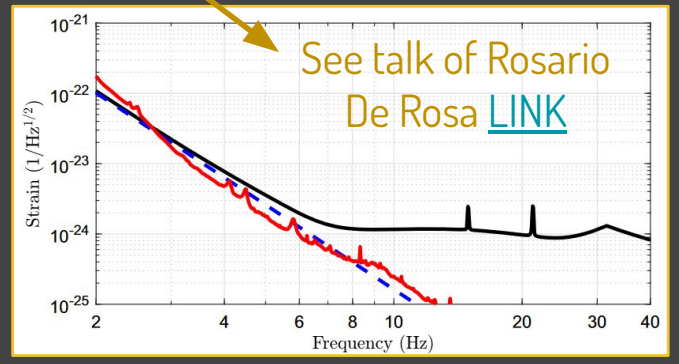
L Naticchioni[1], V Boschi[3], E Calloni[2], M Capello[8], A Cardini[5], M Carpinelli[6,7], S Cuccuru[7], M D'Ambrosio[8], R de Rosa[2], M Di Giovanni[8], D d'Urso[6,7], I Fiori[11], S Gaviano[8], C Giunchi[8], E Majorana[1], C Migoni[5,10], G Oggiano[7], M Olivieri[9], F Paoletti[3], M Paratore[8], M Perciballi[1], D Piccinini[8], M Punturo[4], P Puppo[1], P Rapagnani[1], F Ricci[1], G Saccorotti[8], V Sipala[7], M C Tringali[12]

Seismological Research Letters (2021) 92 (1): 352–364.

**A Seismological Study of the Sos Enattos Area—the Sardinia Candidate Site for the Einstein Telescope**

Matteo Di Giovanni[*1,2,3], Carlo Giunchi[1], Gilberto Saccorotti[1], Andrea Berbellini[4], Lapo Boschi[4,5,6], Marco Olivieri[4], Rosario De Rosa[7,8], Luca Naticchioni[9,10], Giacomo Oggiano[11,12], Massimo Carpinelli[11,12], Domenico D'Urso[11,12], Stefano Cuccuru[11,12], Valeria Sipala[11,12], Enrico Calloni[7,8], Luciano Di Fiore[7], Aniello Grado[13], Carlo Migoni[14], Alessandro Cardini[14], Federico Paoletti[15], Irene Fiori[16], Jan Harms[2,3], Ettore Majorana[9,10], Piero Rapagnani[9,10], Fulvio Ricci[9,10], and Michele Punturo[17]

Projection of NN contribution at Sos Enattos




See talk of Rosario De Rosa LINK

Geophysical Journal International, ggad178 (2023)

**Temporal variations of the ambient seismic field at the Sardinia candidate site of the Einstein Telescope**

M Di Giovanni, S Koley ✉, J X Ensing, T Andric, J Harms, D D'Urso, L Naticchioni, R De Rosa, C Giunchi, A Allocca, M Cadoni, E Calloni, A Cardini, M Carpinelli, A Contu, L Errico, V Mangano, M Olivieri, M Punturo, P Rapagnani, F Ricci, D Rozza, G Saccorotti, L Trozzo, D Dell'aquila, L Pesenti, V Sipala, I Tosta e Melo

- Common tools and methodology missing
- Need to find a common agreement on NN modeling and estimation

# About data interpretation

**Towards the definition of a common ground**

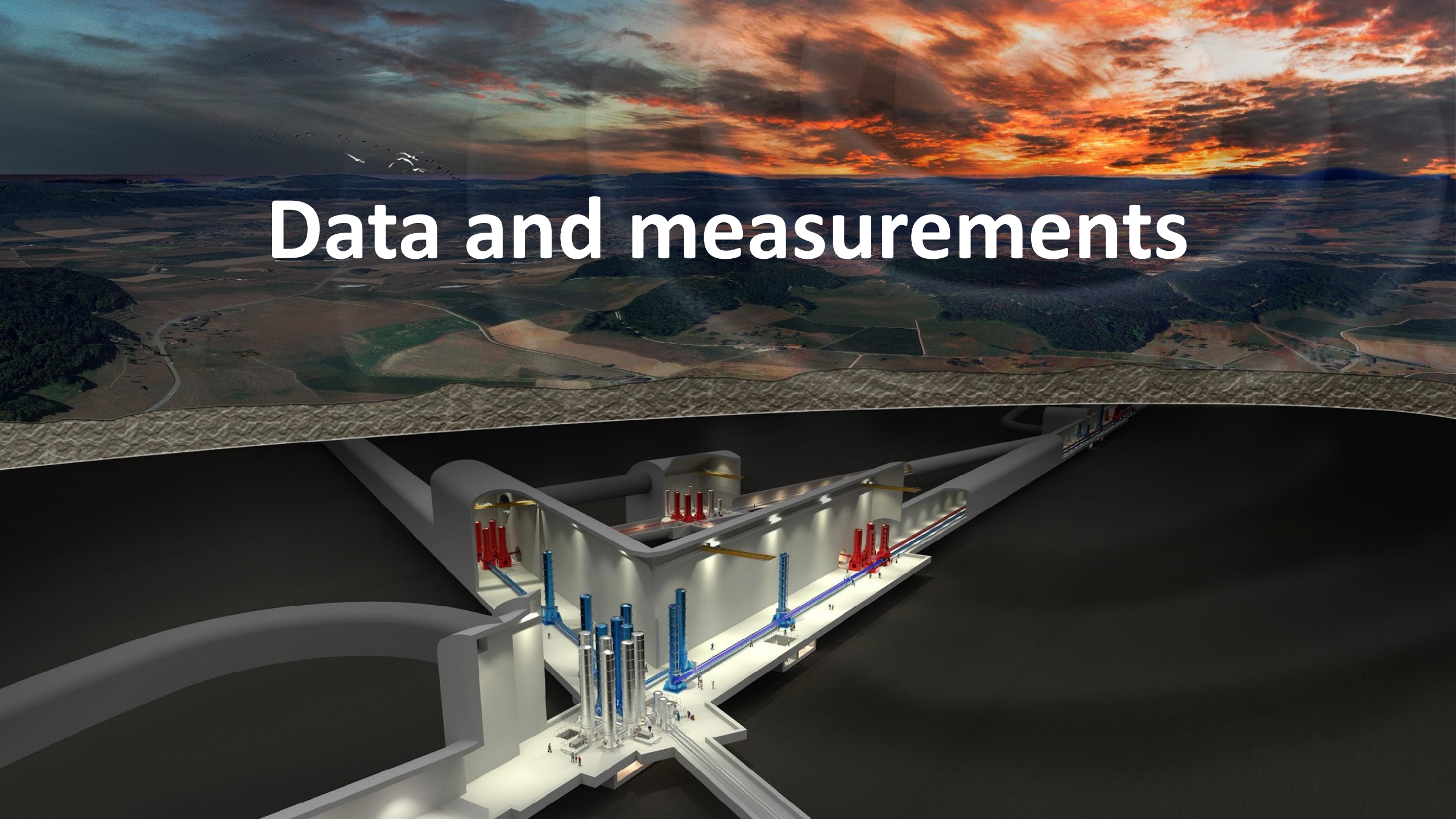
- **Discussion with ISB WDs/WPs**

- **Dedicated SPB Workshop (together with ISB related WPs) in October**
  - **when ? Where ? (Germany?)**

- **At ET annual Meeting final presentation**

- **Report expected by the end of 2023**

# Data and measurements



# Data availability and missing measurements

- All data should be available and well described on the SPB wiki-page (including examples and tutorials)

- Acoustic campaign in Sardinia will be completed by the fall, planning for EMR

- **Magnetic measurements @ EMR**

# Docs to be prepared

- General Strategy (ET-PP):
  - ❑ Concerns, challenges and requirements
  - ❑ Sites descriptions
  - ❑ Characterizations measurements description
  - ❑ standards

Possible timeline ???