ÖAW AUSTRIAN ACADEMY OF SCIENCES

SMI - STEFAN MEYER INSTITUTE

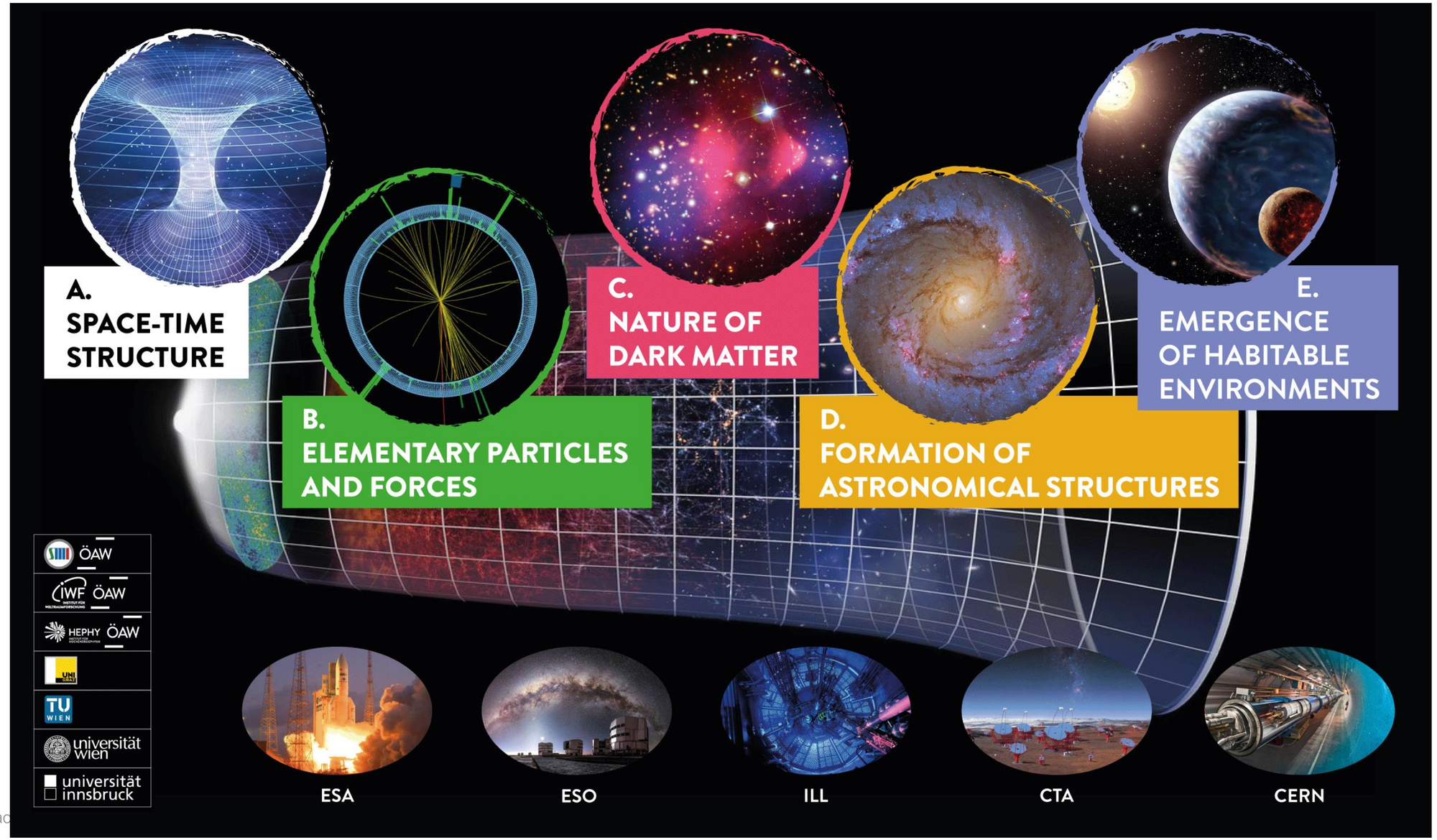
"Cosmic Matters" aftermath

E. Widmann

Director of Research, Cosmic Matters proposal

Stefan Meyer Institute, Vienna

FAKT Workshop, Bruck a. . Mur, 23 – 24 Feb 2023


A.
SPACE-TIME
STRUCTURE
B.
ELEMENTARY PARTICLES
AND FORCES
C.
NATURE OF
DARK MATTER
D.
FORMATION OF
ASTRONOMICAL STRUCTURES
E.
EMERGENCE
OF HABITABLE
ENVIRONMENTS
ÖAW
IWF ÖAW
HEPHY ÖAW
TU WIEN
universität wien
universität innsbruck
ESA
ESO
ILL
CTA
CERN

Outcome

- Pre-proposal was not admitted to stage 2 (full proposal)
- Grade C3
- C3: in resubmission make clear the strengths of the proposal, implement suggestions by referees

Anregungen der Jury: The jury appreciates that the proposal addresses fundamental questions about our universe but questions the added value of such a COE. The proposal is very broad, and the team didn't develop a convincing argument for how they plan to integrate synergistically. It gives one the impression of being a collection of sub-projects. It also remains unclear how the researchers intend to improve the field, and why the five areas of research are bottlenecks. In addition, the team should make a clear statement about what synergies will result from solving the main research problem as a team rather than building on advances in the different domains covered by the proposal. The jury also recommends including expertise in astrochemistry as one of the topics addressed is the emergence of life and therefore this kind of expertise is crucial.

Referee reports

- A: excellent
  - Weak points
    - Weak link E to other RAs
    - Pronounced gender imbalance
  - Excellent researchers but working together has not yet been demonstrated
  - Risk: too little cross-disciplinary collaboration
- B: Very good
  - Working together seen critical, statements overstated and overstretched
  - Experience shows that similar smaller consortia fail
  - DM central theme, promising
  - Gender ratio below 30%
- C: Very good
  - Quantum gravity and planet formation „stretch excessively the scope and focus of the cluster”
  - Gravitational waves missing
- D: Excellent
  - Generally positive

New grant scheme excellent = austria

- Part 1: Custers of Excellence
- **Cosmic Matters**:
  - ÖAW (HEPHY, IWF, SMI), Uni Wien, TU Wien, U Graz, U Innsbruck
  - 35 M€ / 5 years (40% own contribition) additonal 5 years possible after evaluation
  - All particle physics and astrophysics groups in Austria
  - 30+ key researchers
  - CERN, ESO, ESA, ILL
- Struture: Units
  - Research
  - Training: ~ 50 PhD, like DK
  - Communication and transfer
  - Management
  - Infrastructure and methodology
    - Computational facilities
    - Cryolab4ppp
    - A²SCL: Austrian Academy of Sciences Silicon Lab
    - International observational and experimental facilities
    - Software and Algorithms

Board of Directors

Members of the Board of Directors (5-8 persons)								
Function in the Cluster	**Family name**	**First name**	**Academic position**	**Research Institution**	**Faculty**	**Subunit Dept./Inst.**	**Sex**	**Academic age**
Director of Research	Widmann	Eberhard	Director	ÖAW		SMI	M	31
Deputy Director of Research	Helling	Christiane	Director	ÖAW		IWF	F	22
BOD member	Abele	Hartmut	Full professor	TU Wien	Faculty of Physics	ATI	M	28
BOD member	Güdel	Manuel	Head of institute	University of Vienna	Earth Sciences, Geography and Astronomy	Department of Astro-physics	M	31
BOD member	Maas	Axel	Head of institute	University of Graz	Natural Sciences	Institute of Physics	M	17
BOD member	Reimer	Olaf	Full professor	Innsbruck University	MIP	Astro- & Particle Physics	M	26
BOD member	Schieck	Jochen	Director	ÖAW		HEPHY	M	22

RT A: Space-time and fundamental symmetries

- O-A1 – The basic symmetries of nature
  - Abele, Alkofer, Jericha, Maas, Widmann
- O-A2 – Holography as a structure of nature
  - Grumiller, Donnay, Plätzer, Rebhan
- O-A3 – Implications of quantum gravity below the Planck scale
  - Abele, Alkofer, Donnay, Grumiller, Jericha, Kulkarni, Maas, Sexty, Plätzer

- Essential
  - Key Researchers + Board of Directors

RT B: Particles and interactions

- O-B1 – Colliders at the energy frontier
  - Hoang, Maas, Plätzer, Procura, Wulz/Schöfbeck
- O-B2 – At the intensity and precision frontiers
  - Abele, Alkofer, Jericha, Hoang, Inguglia, Pradler, Procura, Rebhan
- O-B3 - All scales
  - Bergauer, Hoang, Schieck, Wulz/Schöfbeck
- O-B4 - Matter under extreme conditions
  - Rebhan, Sexty, new SMI ALICE group
- O-B5 - Highly Energetic Processes Beyond Colliders
  - Helling, Hoang, Plätzer

RT C: Nature of dark matter

- O-C1 – Laboratory searches
  - Abele, Inguglia, Jericha, Kulkarni, Pradler, Reindl, Schieck, van de Ven, Widmann, Wulz/Schöfbeck
- O-C2 – Cosmological and astrophysical aspects
  - Hahn, Pradler, O. Reimer, van de Ven
- O-C3 – Connecting to (quantum) gravity
  - Alkofer, Kulkarni, Maas
- O-C4 – Global perspectives
  - Kulkarni, Reindl, Schieck

RT D: Formation of astronomical structures

- O-D1 – On cosmological scales
  - Hahn, A. Reimer, O. Reimer, van de Ven
- O-D2 – On extragalactic scales
  - Hacar, Kissmann, A. Reimer, O. Reimer, van de Ven
- O-D3 – On Galactic scales
  - Hacar, Fossati, Güdel, Kissmann, A. Reimer, O. Reimer, Temmer, van de Ven, Woitke

RT E: Emergence of habitable environments

- O-E1 – Helio/Astrosphere
  - Fossati, Güdel, Helling, Nakamura, Temmer, Veronig
- O-E2 – Acceleration of Cosmic Rays and Energetic Particles
  - Kissmann, Nakamura, A. Reimer, Temmer, Veronig
- O-E3 – The emergence of habitable worlds in the galactic context
  - Bergauer, Fossati, Güdel, Helling, Temmer, Veronig, Woitke

General remarks

- Pro: community building to utilize the 3 main international facilities of the "FTI Pact: ESA, ESO, CERN
- Issues
  - Connections between RTs
  - Synergies between Key Researchers
  - Synergies for participating institutions
  - Integration of facilities
- Synergies
  - Dark Matter
  - Cosmic rays
  - Multi-scale physical model building
  - creation of new (junior) research groups
  - instrumentation