



The UHECR Snowmass White Paper CF7 checkpoint

Coordinators – F. Sarazin, F. Schroeder, T. Venters
Lead conveners – A. Coleman, J. Eser, E. Mayotte, D. Soldin



Timeline

- White paper coordinators and lead conveners named Sept 15 ✓
- Identify & contact the conveners and experiment representatives Oct 10 ✓
- Create an outline of the white paper. Inform the community. What is the best structure to be also used for a community-wide roadmap document? Encourage contributions from the community! Oct 20 ✓ (mini-workshop)
- Deadline for individual contributions to the various tasks Nov 20 ✓
- Report from each science tasks (<10 pages) & experiments (<5 pages) due Dec 10 ✓
- Update the suggested requirements on future experiments based on the science task and experiment reports. Request information from the experiment representatives to make (comparative) plots. → We are here! Dec 15 to Jan 15
- Include new plots, update experiment section and conclusion of paper. Jan 20 ✗
- Draft of the white paper is released for general review Jan 31 – slipping
- Solicit external reviews Mar 1
- Submit to Snowmass CF7 Mar 15



Preliminary Outline

Executive Summary (1 page)

1. The Big Questions
2. The UHECR Paradigm Shift
3. Physics at the Energy Frontier – the synergy between UHECRs and Particle Physics
4. Pinpointing the Most Extreme Physical Processes in the Universe
5. Stepping Up to the New Challenges
6. The Next Generation Experiments
7. Interdisciplinary science



- **Update** the community on progress, with a special focus on the science
- **Present** the main findings of the science tasks
- **Discuss** how we intend to articulate the white paper around those findings
- **Close the loop** with the experiment representatives and next-gen experiment proponents



WP Coordinators: Fred Sarazin, Frank Schroeder, Tonia Venters

Lead Conveners: Alan Coleman, Johannes Eser, Eric Mayotte, Dennis Soldin

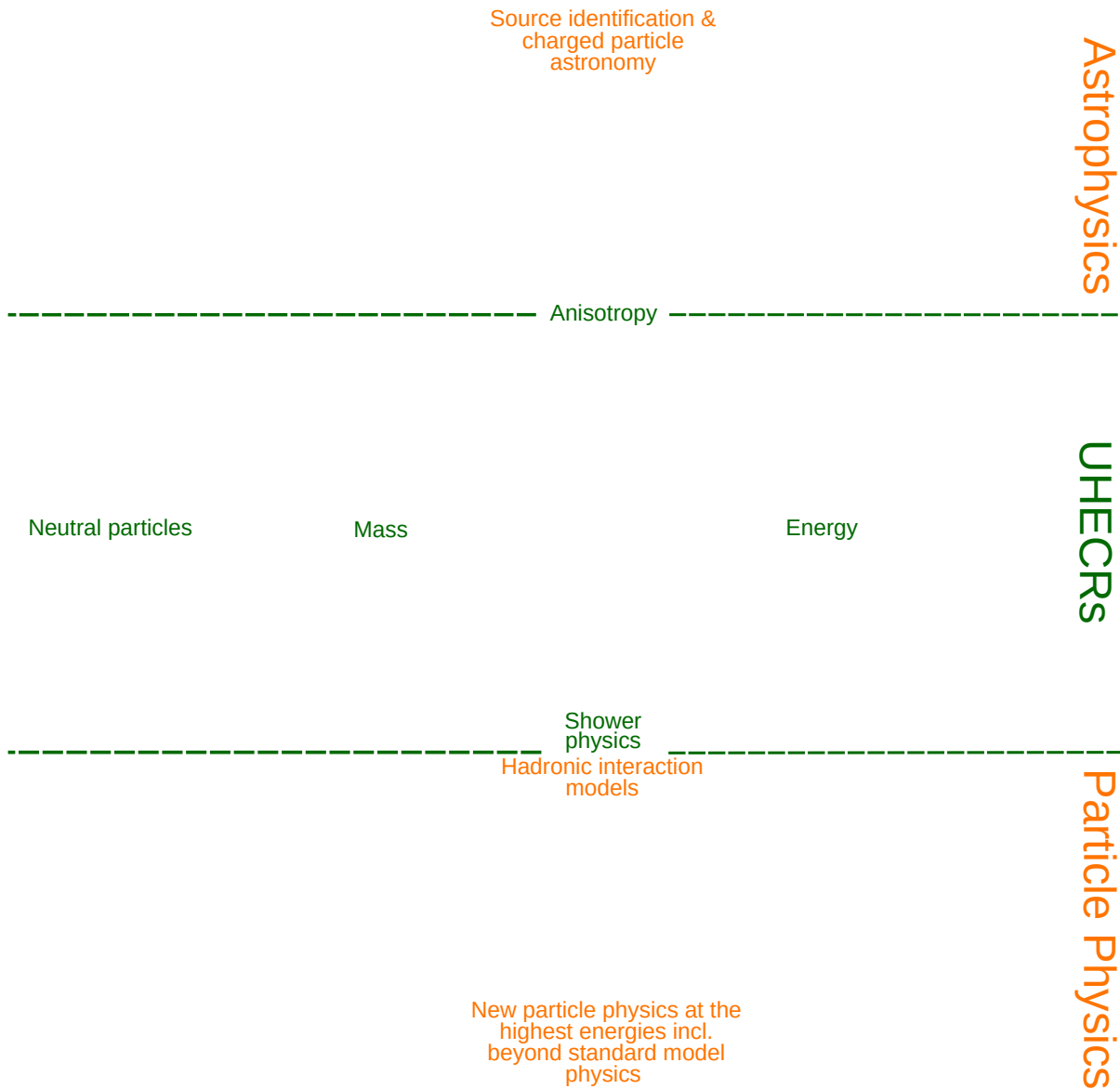
TASKS (2-3 conveners per task)

- **Spectrum** A. Coleman / Y. Tsunesada
- **Composition** D. Bergman / E. Mayotte / A. Yushkov
- **Anisotropy** L. Caccianaga / G. Golup / P. Tinyakov
- **Hadronic interactions** H. Dembinski / T. Pierog / D. Soldin
- **Multimessengers** J. Alvarez-Muniz / J. Eser / L. Lu
- **Astrophysics** F. Oikonomou / T. Venters
- **Magnetic fields*** T. Jaffe / M. Unger
- **BSM (dark matter,...)*** R. Aloiso / O. Deligny
- **Computation*** J. Glombitza / E. Santos / A. Haungs
- **Interdisciplinary** M. Bertaina / R. Mussa

EXPERIMENTS (1 representative per experiment)

- **Auger** A. DiMatteo
- **Ice Cube (incl. Gen 2)** J. Kelley
- **Telescope Array** J. Matthews
- **GCOS** J. Hoerandel
- **GRAND** P. Denton
- **POEMMA (& EUSO)** J. Krizmanic



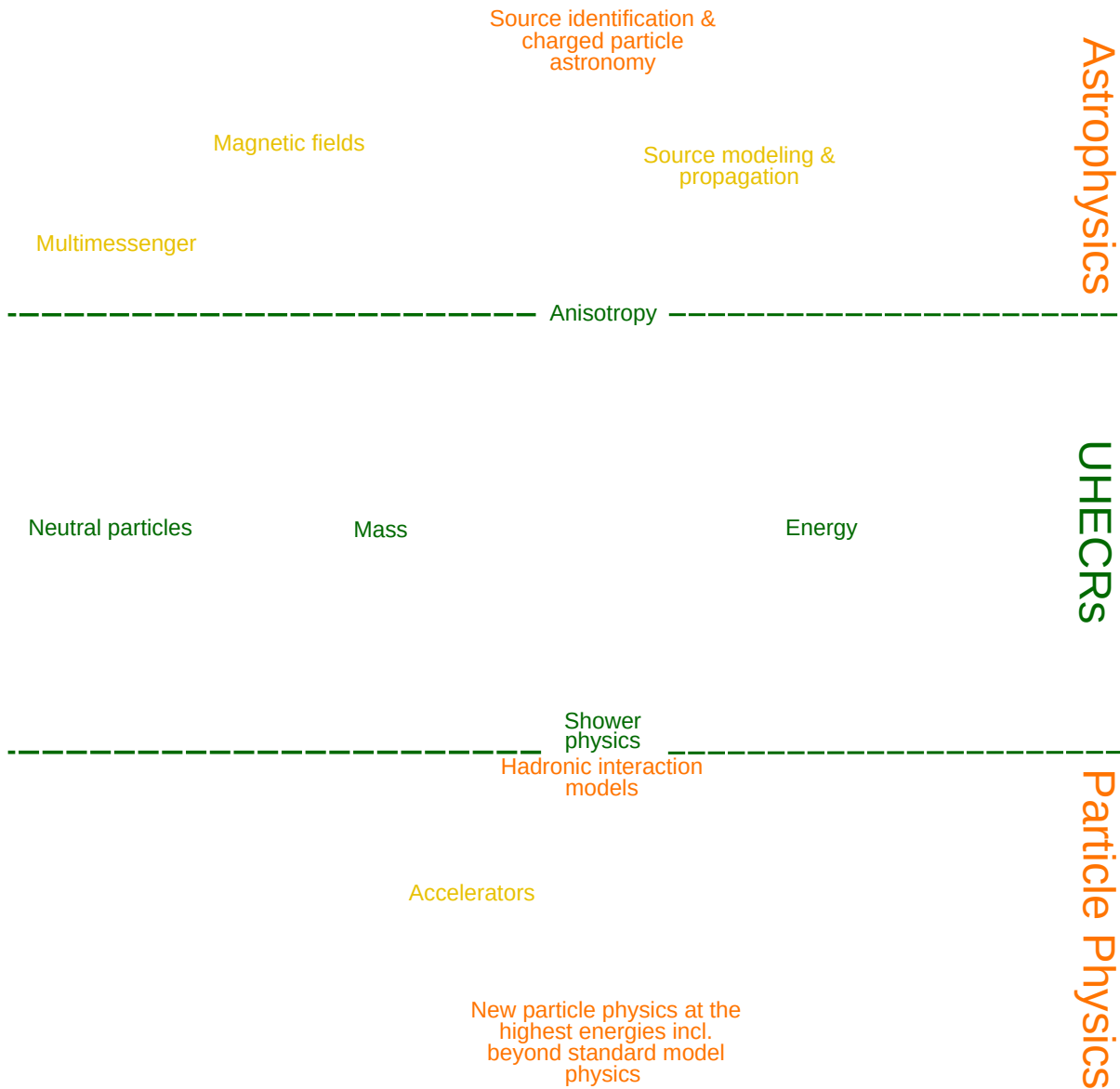


Articulating the white paper

The starting point:

- UHECRs observables and goals

CF7 checkpoint, February 2, 2022



Astrophysics

UHECRs

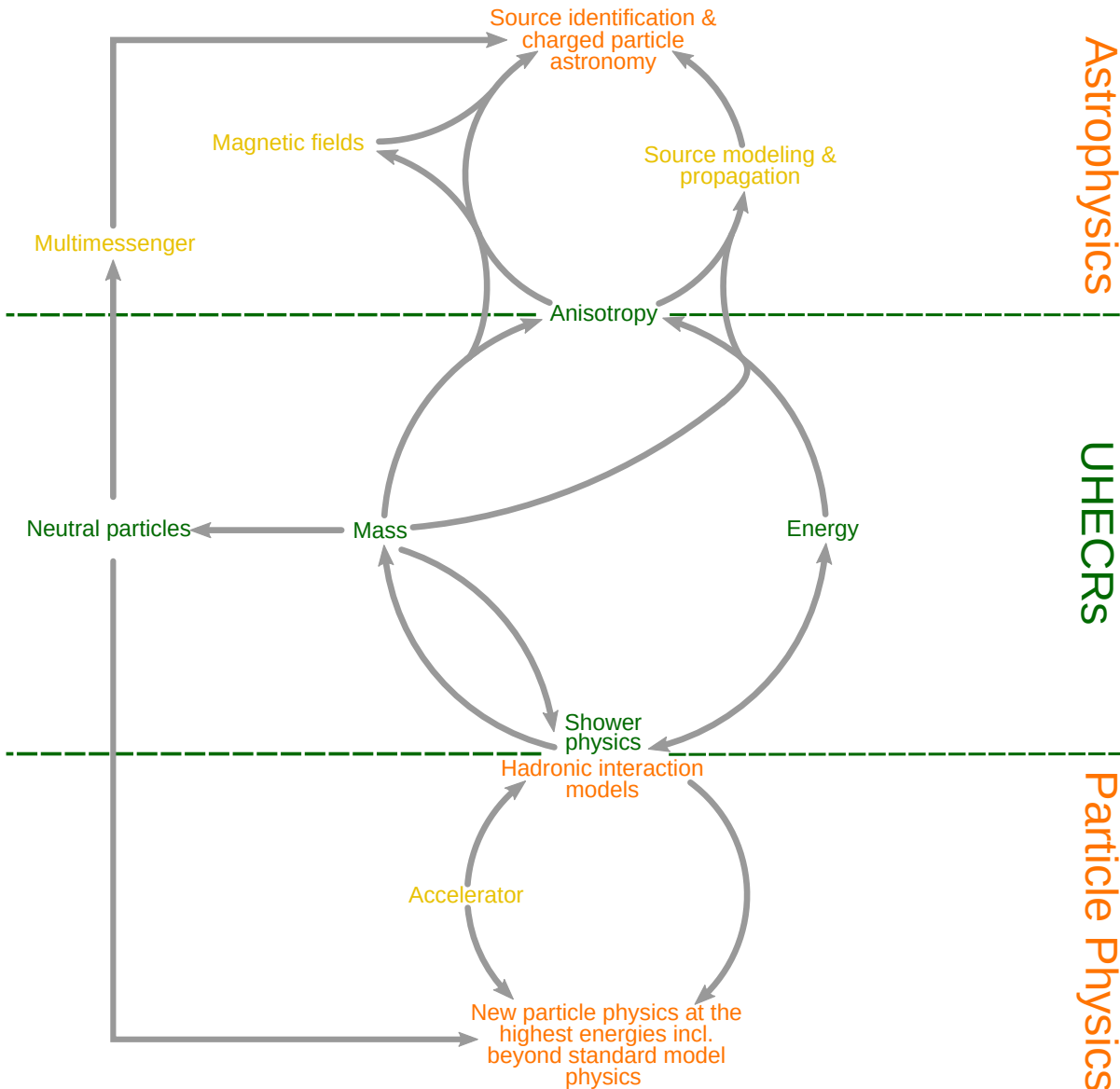
Particle Physics

Articulating the white paper

The starting point:

- UHECRs observables and goals
- Adding related fields

CF7 checkpoint, February 2, 2022



Astrophysics

UHECRs

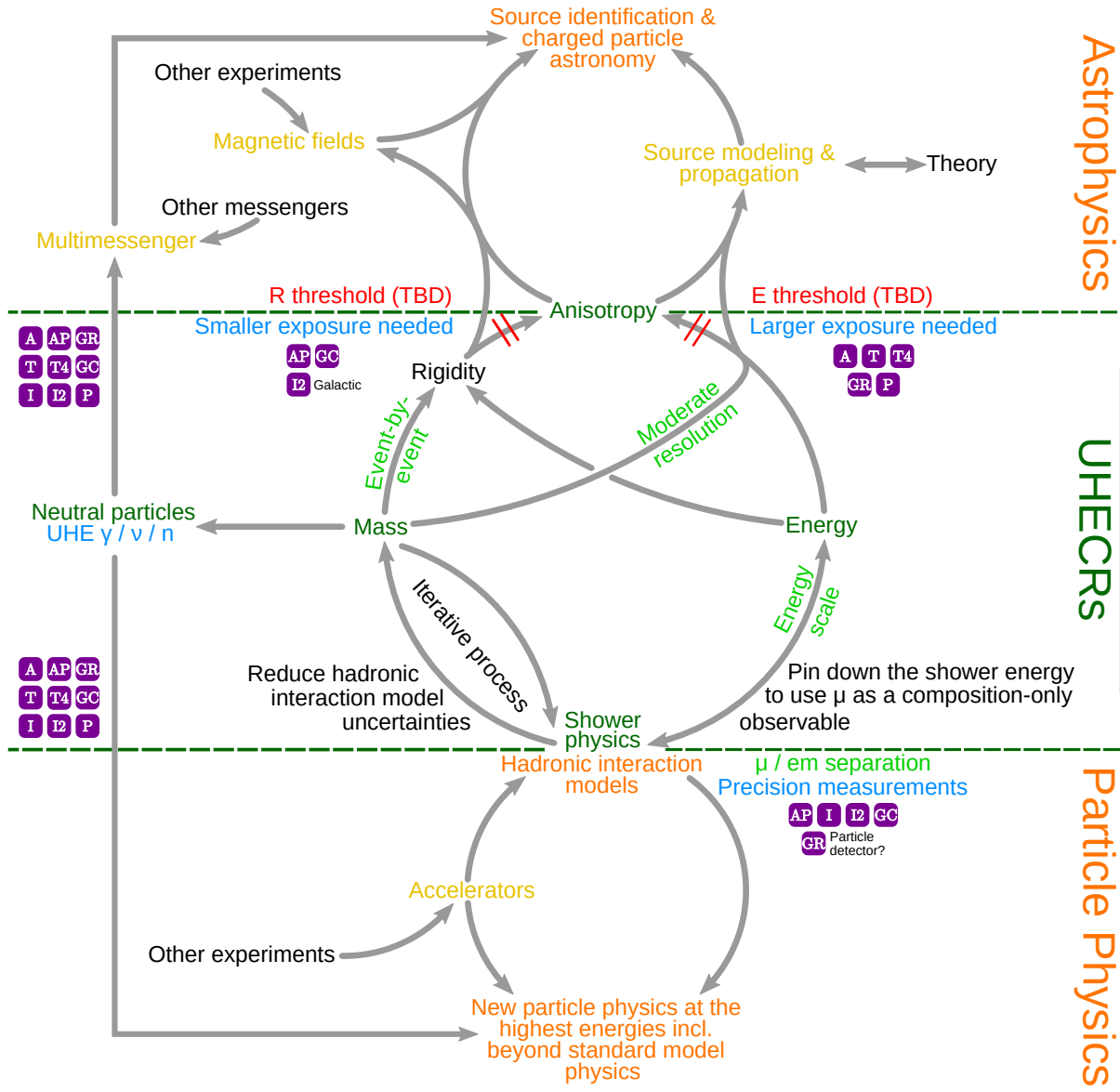
Particle Physics

Articulating the white paper

The starting point:

- UHECRs observables and goals
- Adding related fields
- Draw the connections

Preliminary



Astrophysics

UHECRs

Particle Physics

- Experiments:**
- A Auger
 - AP AugerPrime
 - T TA
 - T4 TAx4
 - I IceCube
 - I2 IceCube Gen2
 - GR GRAND
 - GC GCOS
 - P POEMMA

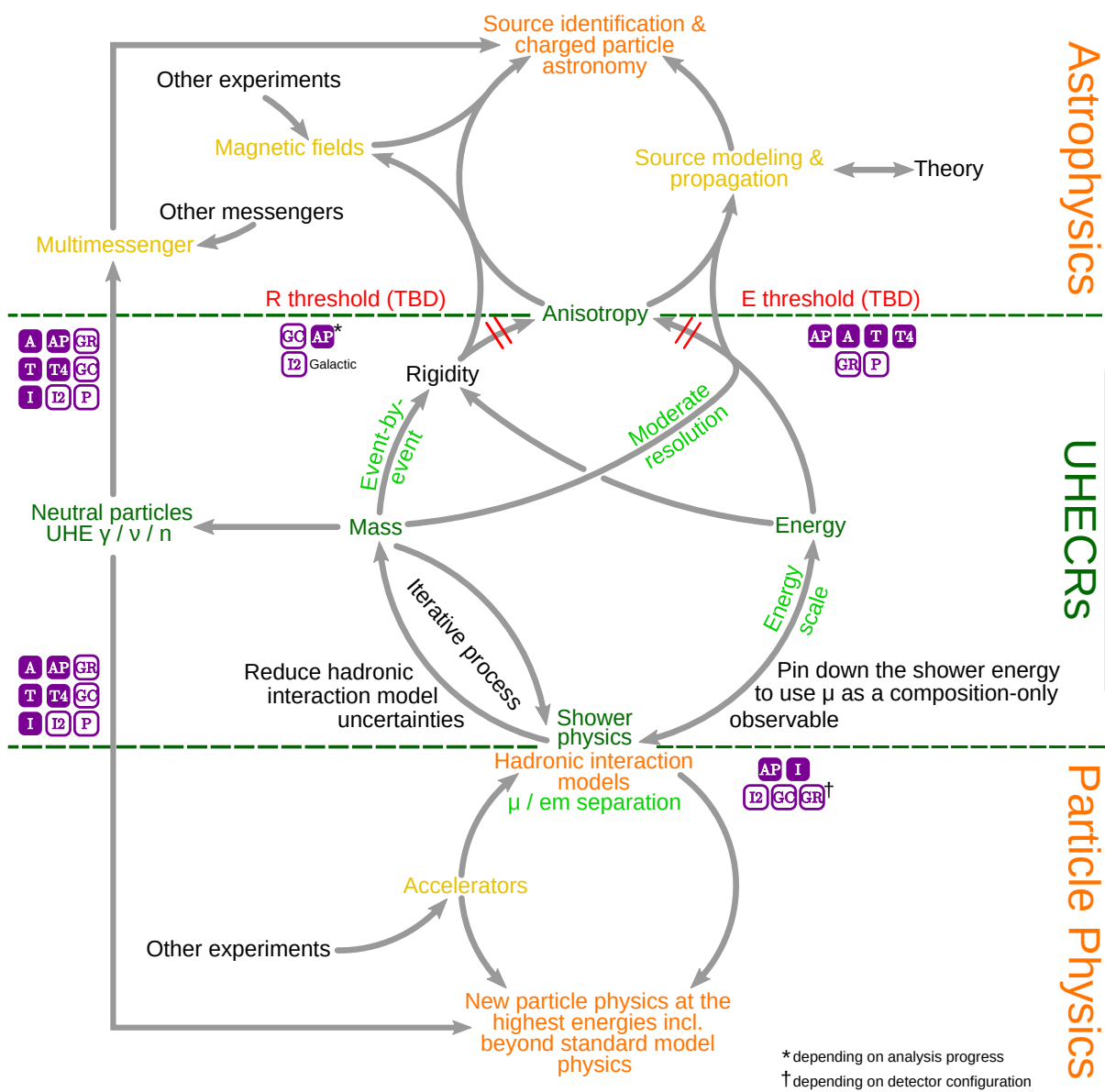
The complete picture?

- UHECRs observables and Goals
- Adding related fields
- Draw the connections
- Identifying the strategies and where experiments (will) contribute

Updated

The complete picture?

- UHECRs observables and Goals
- Adding related fields
- Draw the connections
- Identifying the strategies and where experiments (will) contribute



The next steps

- **Refine** the outline
- **Populate** the white paper
- **Identify** the gaps and transitions
- **Finalize** the white paper and send for internal reviews

Snowmass UHECR WP Task Template	Snowmass2021 w... x
SnowmassWP_HadronicInteractions	Snowmass2021 w... x
SnowmassWP_AstrophysicsTheory	Snowmass2021 w... x
Snowmass UHECR WP Experiment Template	Snowmass2021 w... x
SnowmassWP_Anisotropy	Snowmass2021 w... x
SnowmassWP_Spectrum	Snowmass2021 w... x
SnowmassWP_Radio	Snowmass2021 w... x
SnowmassWP_DarkMatterBSM	Snowmass2021 w... x
SnowmassWP_POEMMA	Snowmass2021 w... x
SnowmassWP_GRAND	Snowmass2021 w... x
SnowmassWP_GCOS	Snowmass2021 w... x
SnowmassWP_TelescopeArray	Snowmass2021 w... x
SnowmassWP_Mass	Snowmass2021 w... x
SnowmassWP_MagneticFields	Snowmass2021 w... x
SnowmassWP_PierreAuger	Snowmass2021 w... x
SnowmassWP_IceCube	Snowmass2021 w... x
SnowmassWP_Computation	Snowmass2021 w... x
SnowmassWP_MultiMessenger	Snowmass2021 w... x
SnowmassWP_InterdisciplinaryScience	Snowmass2021 w... x

