ETK Working Group “Cosmology and particles”

Leads: Eloisa Bentivegna, Helvi Witek

https://docs.einsteintoolkit.org/et-docs/Cosmology_and_Particles

European E INSTEIN T OOLKIT Workshop, Lisbon, 13 September 2018
Scientific objectives

Gravity
- Is general relativity correct?
- Where is it valid?
- Evolution of early universe
  - Test general relativity in new regimes
  - GR & beyond-standard model particle physics

Cosmology
- Inflation
- Structure formation
- Dark matter /energy?

High-energy physics
- Quantum gravity?

⇒ Gravitational waves as search engines for new physics
⇒ Need new developments in Numerical Relativity
Working group members

Numerical relativity
- Einstein Toolkit & friends
- e.g.: GRChombo, Spec

- diverse team with broad expertise
- match theorists & numerical relativists
  - initiate new collaborations

Theory
- cosmology
- modified gravity

Maths
- well-posed formulations
- new numerical methods
  - perturbation theory
• Approved: 4 December 2017

• Deliverables & Milestones:
  • currently: build community, brain storming, sharing of knowledge
  • future: development of new thorns & code revision, benchmarking between different codes

• Activities:
  • regular calls: first Monday of month 4:30pm (UK) / 10:30am (CDT)
  • discussion & presentation of dedicated topics
  • next call: 1 October 2018 with
    I. Cordero-Carrión on constraint vs free evolution schemes

• Important links:
  • https://docs.einsteintoolkit.org/et-docs/Cosmology_and_Particles
  • Mailing list: cosmoparticle-wg@einsteintoolkit.org
  • Sign-up: http://lists.einsteintoolkit.org/mailman/listinfo/cosmoparticle-wg
Who are we?

Links:

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