Overview

- Introduction to PhysPAG
- Technology gaps assessment
- Preliminary discussion of CoPAG Technology Interest Group concept
- Highlights and near-term activities
Physics of the Cosmos Science Objectives

- Increase our knowledge of dark energy
- Precisely measure the cosmological parameters governing the evolution of the universe and test the inflation hypothesis of the Big Bang
- Test the validity of Einstein's General Theory of Relativity and investigate the nature of spacetime
- Understand the formation and growth of massive black holes and their role in the evolution of galaxies
- Explore the behavior of matter and energy in its most extreme environments
Six Science Interest Groups (SIGs):

- Cosmic Rays (Cosmic SIG)
- Cosmic Structure (CosSIG)
- Gamma-ray Astrophysics (Gamma SIG)
- Gravitational Waves (GWSIG)
- Inflation Probe (IPSIG)
- X-ray Astrophysics (X-Ray SIG)
Technology “Gaps” Assessment (1/3)

• Physics of the Cosmos Program Office requests community input on technology development needs (‘gaps’) for strategic missions.
• Community and other inputs are prioritized annually by PCOS Technology Management Board
  – Prioritization guides selection of projects funded by the Strategic Astrophysics Technology call
• PhysPAG is asked for support in refining (not prioritizing) community input. Charge to PhysPAG:
  – Consolidate community input
  – Refine/clarify descriptions
  – Add missing gaps
  – Identify gaps not relevant to Strategic Missions, viz., those prioritized by Decadal Survey and/or identified in Astrophysics Strategic Plan, viz. 
    o Athena, HabEx, Inflation Probe, LISA, LUVOIR, Lynx, OST
Technology “Gaps” Assessment (2/3)

- **PhysPAG EC recommendations to PCOS Program Office**

<table>
<thead>
<tr>
<th>Relevant Mission</th>
<th>Total Reviewed</th>
<th>PhysPAG Recommendation</th>
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<tbody>
<tr>
<td>Inflation Probe</td>
<td>2</td>
<td>Forward all as is to TMB</td>
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<td>LISA</td>
<td>7</td>
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<td>Lynx</td>
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<td>4 Forward as is</td>
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<tr>
<td></td>
<td></td>
<td>2 Forward as edited</td>
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<tr>
<td></td>
<td></td>
<td>3 Consolidated</td>
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<tr>
<td>Multiple</td>
<td>3</td>
<td>2 Forward to TMB</td>
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<tr>
<td></td>
<td></td>
<td>1 consolidated</td>
</tr>
<tr>
<td>Not strategic</td>
<td>12</td>
<td>Do not forward to TMB</td>
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<tr>
<td>Total</td>
<td>33</td>
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- **Note:** 6 of the technology needs in the ‘non-strategic’ category are relevant to Astrophysics Probe mission concepts now under study
PhysPAG EC is concerned by the number of submissions which were not relevant to strategic missions.

We therefore requested that the PCOS Technologist ensure that future calls for community input name strategic missions explicitly.
Preliminary Review CoPAG Technology Interest Group

• As recommended by APAC, PhysPAG has begun to consider applicability of CoPAG’s Technology Interest Group concept to PhysPAG

• May 15 EC preliminary discussion suggests:
  – There is some interest in a technology working group within PhysPAG
  – With PhysPAG’s very broad range of observational techniques, the CoPAG-wide TIG model might not be easily adaptable to PhysPAG; PhyPAG’s SIG-based technology assessment seems better suited.
  – SIG leaders are generally confident that they understand SIG technology needs well.
Other PhysPAG Highlights & Activities

• NICER launched and is operating on ISS!
• ISS-Cream launch is imminent (10 August)!
• L3 Study Team
  – LISA formally selected as L3 mission by ESA (20 June)
  – L3ST met face-to-face 20 July in Pasadena, outlining Decadal report for LISA. Report will update LISA science case & re-affirm US participation.
• AAS/HEAD meeting August 20-24 in Sun Valley features:
  – PCOS Town Hall (Probes, Lynx)
  – X-ray SIG meeting & Gamma-SIG town hall
  – Special sessions on LISA/GW, NICER first results, X- and Gamma-ray polarimetry, and cosmic-ray feedback
PhysPAG EC membership

New members as of January 2017

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Area of Expertise</th>
<th>Term Ends</th>
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</thead>
<tbody>
<tr>
<td>M. Bautz (Chair)</td>
<td>MIT</td>
<td>X-ray astrophysics</td>
<td>Dec 2017</td>
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<tr>
<td>R. Bean</td>
<td>Cornell University</td>
<td>Dark energy</td>
<td>Dec 2017</td>
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<tr>
<td>J. Beatty</td>
<td>Ohio State University</td>
<td>Particle astrophysics</td>
<td>Dec 2019</td>
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<tr>
<td>J. Conklin (Vice Chair)</td>
<td>Univ. of Florida</td>
<td>Gravitational waves</td>
<td>Dec 2017</td>
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<tr>
<td>O. Doré</td>
<td>JPL</td>
<td>Dark energy</td>
<td>Dec 2017</td>
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<tr>
<td>S. Guiriec</td>
<td>George Washington University</td>
<td>Gamma-ray astrophysics</td>
<td>Dec 2019</td>
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<tr>
<td>K. Holley-Bockelmann</td>
<td>Vanderbilt University</td>
<td>Gravitational waves</td>
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<td>R. Kraft</td>
<td>SAO</td>
<td>X-ray astrophysics</td>
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<tr>
<td>H. Krawczynski</td>
<td>Washington University</td>
<td>Gamma-ray astrophysics</td>
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<td>A. Miller</td>
<td>Columbia University</td>
<td>CMB</td>
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<tr>
<td>I. Moskalenko</td>
<td>Stanford University</td>
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<tr>
<td>J. Tomsick</td>
<td>UC Berkeley</td>
<td>X-ray and Gamma-ray astrophysics</td>
<td>Dec 2019</td>
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<tr>
<td>E. Wollack</td>
<td>NASA/GSFC</td>
<td>CMB</td>
<td>Dec 2017</td>
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