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Mid-Decade Outlook for Balloon-Borne Particle Astrophysics Research

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The NASA Particle Astrophysics Program covers the Origin of the Elements, Nearest Sources of Cosmic Rays, How Cosmic Particle Accelerators Work, The Nature of Dark Matter, and Ultrahigh Energy Neutrinos. Progress in each of these topics has come from sophisticated instrumentation flown on Long Duration Balloon (LDB) flights around Antarctica for more than two decades. Super Pressure Balloons (SPB) and International Space Station (ISS) platforms are emerging opportunities that promise major steps forward for these and other objectives. NASA has continued development and qualification flights leading to SPB flights capable of supporting 1000 kg science instruments to 33 km for upwards of hundred day missions, with plans for increasing the altitude to 38 km. This goal is even more important now, in view of the National Research Council Astro2010 Decadal Study recommendation that NASA should support ultra-long duration ballooning development. Astro2010 emphasized that NASA should support such missions for indirect detection of dark matter and for cosmic-ray physics and astrophysics. Scientific ballooning as a vital infrastructure component for cosmic ray and general astrophysics investigations, including training for young scientists, graduate and undergraduate students, leading up to the 2020 Decadal Study and beyond, will be presented and discussed.

Collaboration

– not specified –

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