

Peering Beneath the Ice Sheet: AGAP Evidence for a More Dynamic East Antarctica

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Exploring the history of the East Antarctic Ice Sheet and lithospheric structure of the Gamburtsev Subglacial Mountains were primary goals of the International Polar Year. Scientists from seven nations have launched a flagship program (AGAP) to explore the Gamburtsev Subglacial Mountains buried by the East Antarctic ice sheet and bounded by numerous subglacial lakes. The AGAP umbrella is a multi-national, multi-disciplinary effort and includes aerogeophysics, passive seismology, traverse programs and will be complimented by future ice core and bedrock drilling. A major new airborne data set including gravity; magnetics; ice thickness; SAR images of the ice-bed interface; near-surface and deep internal layers; and ice surface elevation is providing insights into a more dynamic East Antarctica. More than 120,000 km of aerogeophysical data have been acquired from two remote field camps during the 2008/09 field season. AGAP effort was designed to address four fundamental questions: 1) What role does topography play in the nucleation of continental ice sheets? 2) How are major elevated continental massifs formed within intraplate settings but without a straightforward plate tectonic mechanism? 3) How do tectonic processes control the formation, distribution, and stability of subglacial lakes? 4) Where is the oldest climate record in the Antarctic ice sheet? Preliminary results point towards a more dynamic East Antarctic ice sheet and a more complex tectonic evolution for East Antarctica.