

## Second International Conference on the Physics of the Two Infinities



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### Search for B Mesogenesis and Dark Matter at BABAR

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We present the most recent BABAR searches for reactions that could simultaneously explain the presence of dark matter and the matter-antimatter asymmetry in the Universe. This scenario predicts exotic B-meson decays into an ordinary-matter baryon and a dark-sector anti-baryon  $\bar{\chi}_D$  with branching fractions accessible at the B factories. The results are based on the full data set of about  $430 \text{ fb}^{-1}$  collected at the  $Y(4S)$  resonance by the BABAR detector at the PEP-II collider. We search, in particular, for decays like  $B \rightarrow \bar{\chi}_D B$  where B is a baryon (proton,  $\bar{n}$  or  $\bar{\Lambda}_c$ ). The hadronic recoil method has been applied with one of the B mesons from  $Y(4S)$  decay fully reconstructed, while only one baryon is present in the signal B-meson side. The missing mass of signal B meson is considered as the mass of the dark particle  $\bar{\chi}_D$ . Stringent upper limits on the decay branching fraction are derived for  $\bar{\chi}_D$  masses between 0.5 and 4.3  $\text{GeV}/c^2$ .

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