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Interpreting Ultrahigh Energy Cosmic-Ray Anisotropies CHEN DING, NOEMIE GLOBUS, GLENNYS FARRAR, New York Univ NYU — The Pierre Auger Observatory reports significant evidence of a large-scale anisotropy in the arrival directions of cosmic rays above 8 EeV, and a hotspot-like anisotropy above 40 EeV. We show that both of these anisotropies naturally arise from sources following the large-scale structure of the Universe, when deflections in extragalactic and Galactic magnetic fields are taken into account. By contrast, the hotspot reported by Telescope Array does not emerge from our large-scale structure model and requires the existence of relatively nearby particular source. A composition close to nitrogen above 40 EeV gives the best fit to the Auger hotspot, and the fit to the dipole anisotropy at lower energy constrains the parameters of extragalactic and Galactic magnetic fields, showing that future refined studies of anisotropy can help learn about diverse physical phenomena.

Chen Ding
New York Univ NYU

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