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The Pierre Auger Research and Development Array (RDA) in southeastern Colorado – R&D for a giant ground array

The Pierre Auger Research and Development Array was originally designed to be the precursor of the northern Auger observatory, an hybrid array of 4400 surface detectors and 39 fluorescence detectors deployed over 8,000 square miles. It is conceived as a test bed aiming at validating an improved and more cost-effective 1-PMT (instead of 3 in the current design) surface detector design and a new peer-to-peer communication system. The array of ten surface detectors and ten communication-only stations is currently being deployed in southeastern Colorado and will be operated at least until the end of the year. It is configured in such a way that it allows testing of a new peer-to-peer communication protocol, as well as a new surface detector electronics design with a larger dynamic range (22 bits instead of 15 in the current design) aiming at reducing the distance from the shower core where saturation is observed. All these developments are expected in the short term to improve the performance of the Pierre Auger Observatory and enable future enhancements. In the longer term, it is hoped that these new developments will also contribute to the design of a next-generation giant ground array.

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