

# Detecting the Highest Energy Particles Produced by Nature



Pierre Sokolsky

Distinguished Professor, Physics and Astronomy, University of Utah, 1983 - current Dean, Emeritus College of Science, University of Utah

## CURRENT RESEARCH

### Nature's energy frontier with detectors of unprecedented sensitivity

The highest energy particles known to man, called cosmic rays, arrive from outside our galaxy and reach the Earth's surface once per square kilometer per century. For this reason, researchers need large detectors, with areas approaching 1000 square kilometers to even attempt detecting such particles. Dr. Pierre Sokolsky, of the University of Utah, pioneered the development of a technique to study these ultra-high energy particles by utilizing the natural fluorescence of the atmosphere. This technique revolutionized our understanding of where these particles are coming from, what kind of particles they are, and how high their energy can reach. In fact, he operates the largest and most sensitive cosmic ray observatory in the northern hemisphere. His current project, called the Telescope Array, consists of telescopes and surface detectors covering a 700 square kilometer area in the western Utah desert. The impact of understanding such processes in plasma physics, elementary particle physics, general relativity as it applies to black holes, and the evolution of galaxies could be enormous.

Aside from the specific questions Dr. Sokolsky's research may help answer, his work also offers a glimpse into the amazing unknown processes of our universe. These subatomic particles bombard the Earth from space and some of them carry energies millions of times higher than anything that can be created in a laboratory. Understanding their nature and origin, will allow scientists to make sense of this unprecedented concentration of energy. An unexpected development thus far has been Dr. Sokolsky's discovery of a clumping, or "hotspot" of the highest energy cosmic rays emanating from a location near the Big Dipper. He and...

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## AFFILIATION

 University of Utah

## EDUCATION

- Ph.D. in Physics, 1973  
University of Illinois, Urbana-Champaign
- B.A. in Physics, 1967  
University of Chicago

## AWARDS

- Guggenheim Foundation Fellow, 2002-2003
- Fellow, American Physical Society, 2002
- State of Utah Governor's Medal for Science, 2006
- American Physical Society W.K.H. Panofsky Prize for Experimental Particle Physics, 2008
- Distinguished Professor of Physics and Astronomy University of Utah, 2012

## RESEARCH AREAS

Environment, Atmospheric / Space, Clean Energy, Space

## FUNDING REQUEST

Your contributions will support Dr. Pierre Sokolsky's continued research, as he and his team at the University of Utah detect rare cosmic rays. Your donations will support the \$15K per equipment module required to expand detection abilities. Additional donations will support operational costs totaling \$2M per year. In choosing to donate, you will be a part of shedding light on some of the most mysterious questions in our universe which may lead to shifting our current understanding of the laws of nature.