utation for theoretical physics," I commented. "Yes, but you have such a man as Feynman. After the death of Landau we have nobody to take his place. You have also people such as Bardeen, Cooper and Schrieffer ... very good people."

In accepting the degree Kapitsa commented how happy he was to be at the university where Enrico Fermi, Isidor Rabi and Leo Szilard worked. He concluded, "International collaboration is the base of rapid and fruitful development of science." If our two countries have friendship, he said, then we will not have an atomic war. —GBL

NAS Panel Details Advantages Of A Large Telescope in Space

In still another National Academy of Sciences report on US needs in astronomy, an ad hoc panel of the Space Sciences Board argues that a large (120-inch aperture) space telescope could help answer many of today's basic questions. Operated in orbit or on the moon, such an instrument could study objects five magnitudes fainter and ten times further away than is possible on earth. The panel says that the space telescope would be able to make the first measurements of the density, composition and physical state of the gas that surrounds galaxies, an important clue to galactic evolution. The eight-man committee, headed by Lyman Spitzer Jr. (Princeton), added that the telescope's chief value might well lie, however, in the discovery of entirely new classes of objects.

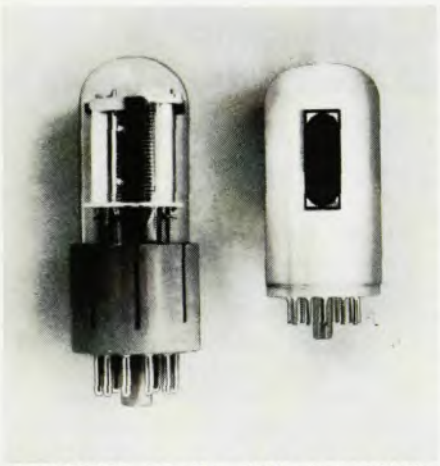
New Spectrometer to Measure 10^{13}-eV Cosmic-Ray Events

A huge ionization spectrometer using image intensifiers to record electromagnetic cascades is operating at the Louisiana State University Cosmic Ray Laboratory near Climax, Colorado. Richard W. Huggett, speaking at the eleventh International Conference on Cosmic Rays at Budapest in August, said that the apparatus will measure ultra-high energy (about 10^{13} eV) hadronic interactions. (His collaborators were Harry Coxell, C. Richard Gillespie, David R. Humphreys and P. Kevin MacKeown.)

Hadrons from cosmic rays strike a carbon target; the interaction products then pass through an emulsion cham-

New RCA Quantacon photomultipliers with virtually constant response from UV to IR

RCA



QUANTACON identifies RCA photomultiplier tubes using negative electron affinity materials as photocathodes and/or secondary emitters. Shown here: C31025B, C, D, and E (glass envelope types); C31025 and C31025A (ceramic envelope types with UV-grade sapphire window).

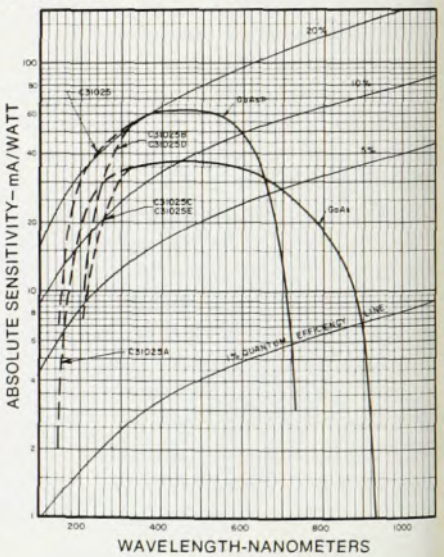
All new! Six QUANTACON photomultipliers offer designers unique, virtually constant spectral response characteristics—heretofore unavailable in any photomultiplier.

Three of these new developmental types use gallium-arsenide photocathodes with a response that extends beyond 900 nm. Three use gallium-arsenide-phosphide photocathodes with a response extending beyond 700 nm. Spectral response for tubes using either material is essentially constant. High sensitivity is maintained from UV to near IR.

The gallium-arsenide types (C31025A, C31025C, C31025E) provide unparalleled performance for use in near-IR laser detection and Raman spectroscopy, while the gallium-arsenide-phosphide types (C31025, C31025B, C31025D) are suitable for use in spectrophotometric, colorimetric, and allied applications.

For further information, ask your local RCA Representative or your RCA Industrial Tube Distributor. For technical data, write: RCA Electronic Components, Commercial Engineering, Section A-159/ZP3, Harrison, N. J. 07029. In Europe: RCA International Marketing S. A., 2-4 rue du Lièvre, 1227 Geneva, Switzerland.

Photocathode Spectral Response Characteristics



Type	Spectral Range (nm) (1)—Total Range (2)—At 70% Points	Typical Cathode Radiant Sensitivity mA/W	Typical Quantum Efficiency %	Maximum Anode Dark Current nA (22°C)
C31025	(1) 150—760 (2) 250—640	61 @ 450 nm	21% @ 300 nm 8.6% @ 632.8 nm	5 @ 20 A/lm
C31025A	(1) 150—940 (2) 230—720	37 @ 450 nm	13.1% @ 300 nm 6.4% @ 632.8 nm 1.9% @ 860 nm	5 @ 20 A/lm
C31025B	(1) 200—760 (2) 290—640	61 @ 450 nm	21% @ 350 nm 8.6% @ 632.8 nm	0.5 @ 2 A/lm
C31025C	(1) 200—940 (2) 280—720	37 @ 450 nm	13.1% @ 300 nm 6.4% @ 632.8 nm 1.9% @ 860 nm	0.5 @ 2 A/lm
C31025D	(1) 200—760 (2) 290—640	61 @ 450 nm	21% @ 350 nm 8.6% @ 632.8 nm	0.5 @ 2 A/lm
C31025E	(1) 200—940 (2) 280—720	37 @ 450 nm	13.1% @ 300 nm 6.4% @ 632.8 nm 1.9% @ 860 nm	0.5 @ 2 A/lm

Be sure to see the RCA Exhibit at the 18th Annual Physics Show, Palmer House, Chicago, January 26-28, 1970.

ber and an ionization spectrometer, whose dimensions are about 2 × 1 × 5 meters. Energy loss in the scintillators is measured by an array of phototubes. Whenever the total energy loss exceeds a certain threshold, a picture is taken of the event by stereoscopic cameras that view the scintillators through two perpendicular image intensifiers.

Electromagnetic showers from neutral pion decay gamma rays are initiated in the emulsion chamber and then fully develop in the ionization spectrometer below as the observed cascades. From pictures and phototube signals the direction and energy of each of several simultaneous cascades may be determined.

The emulsions, spectrometer and intensifier will measure not only the number of interactions but also the energy spectrum and multiplicity of pions, one of the principal products of such high-energy reactions.

Huggett and collaborators at the Max Planck Institute in Munich have used a similar apparatus that is, however, much smaller and does not have image intensifiers, in a balloon experiment to measure the cosmic-ray proton spectrum. They find the primary cosmic-ray protons between 40 and 400 GeV have the same intensity as the latest result from the Soviet Proton III satellite. Huggett and his Munich colleagues are now designing a spectrometer to put on a satellite.

NSF Extends Deep-Sea Drilling Project for Another 3 Years

The National Science Foundation has tripled the life of the Deep Sea Drilling Project by adding 36 months and $22 million to the original plan. So far, the specially designed ship has been able to bore up to 1000 meters into the ocean bottom at 66 sites in water depths up to 6000 meters. The extension provides for 15 more two-month cruises in the Atlantic, Pacific and Indian Oceans and the Mediterranean Sea. Drilling on the first seven legs of the initial contract have produced some evidence that continental drift is still taking place, that the ocean basins are relatively young features of the earth, that the Northwest Pacific is much older than any part of the Atlantic, and that there may be large petroleum deposits under the Gulf of Mexico. □