plots that had been mystifying.

Many theorists are working on the representation, especially attempting to make the theory unitary (as probability must be conserved). If one can add unitarity to the theory, it would mean that we live in a world composed of an infinite variety of resonances.

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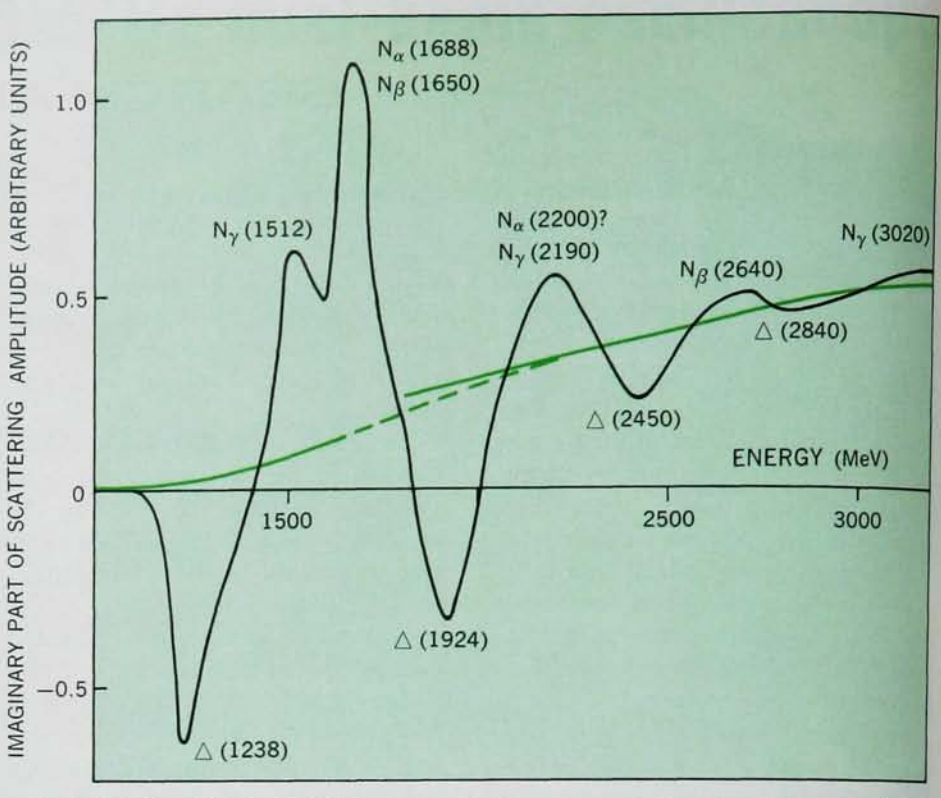

SCATTERING AMPLITUDE for π–n scattering represented by two Regge fits (color) and by resonances. One can write the scattering amplitude either as a sum of a large number of resonances or with the Regge asymptotic formula. This duality concept is a key feature of the Veneziano representation. –FIG. 2

Grids Instead of Walls for Electrogasdynamic Generators

A change in the design of pilot experiments at Gourdine Systems, Inc., makes the prospects for efficient generation of electricity by electrogasdynamics more promising.

The electrogasdynamic (EGD) power generator is like a Van de Graaff generator without the moving belt. Charged dust particles are carried to the high-potential terminal in a moving hot gas stream. The system is thus a high-potential, high-impedance output device, unlike those of the competing system, magnetohydronamics (MHD), which are low-impedance, high-current devices. One advantage over MHD is that no large magnet is necessary in EGD.

Early experiments with EGD generators showed that efficiency is lost when the charged particles precipitate onto the walls of the ceramic tubes instead of making their way to the high-voltage terminal. Meredith Gourdine, president of the company, and his research director, Ernst de Haas, recently demonstrated their new system. Instead of many separate parallel channels with solid ceramic walls they now use one large channel with a grid system that essentially divides the single channel into many small parallel ones. The grids define the flow path and provide "walls" of greater than 90% transparency.

The first model built in this way provides 4 watts of power at 120 000 volts. de Haas believes that industrial models will go to 500 MW at 40% efficiency, with input gas temperatures of 1000°C.

Crab Pulsar Optically Identified; Other Pulsars Show Slowdown

Pulsar NP 0532, near the center of the Crab Nebula, pulses optically with the same period as its radio emissions, according to W. John Cocke, Michael J. Disney and Donald J. Taylor of the Steward Observatory (International Astronomical Union Circular No. 2128, 1969). The University of Arizona group, using a 36-inch reflector, discovered light flashing at the apparent radio period of 0.033095 sec from the region of a well known starlike object in the nebula.

Optical variation in NP 0532 was confirmed by Malcolm MacFarlane, Brian Warner and Ed Nather, using the 82-inch telescope at the McDonald Observatory, Texas, and by Stephen P. Maran, Roger Lynds and Donald Trumbo of Kitt Peak National Observatory, using an 84-inch telescope. The Kitt Peak workers isolated the light flashes to the starlike object with a precision of better than 1 arc sec. Last spring the Kitt Peak group had found light variation from CP 1919 that had a period twice the radio period, but subsequent confirmation was later withdrawn. Unlike the weak light from CP 1919, which had to be integrated for hours, the Crab source could be seen by simply sweeping the equipment about 30 times a second for less than a minute.

The pulse shape as a function of time appears the same in both the optical and radio regions; this suggests the same mechanism that beams the radio emission also beams the optical flashes.

Slow down. NP 0532 was the first pulsar reported to be slowing down (PHYSICS TODAY, February, page 67). The rate at which its period is lengthening, 1 part in 2000 per year, implies that the lifetime of the physical characteristics that cause radio pulsations is approximately several thousand years.

Since then John G. Davies, G. C. Hunt and F. Graham Smith of Jodrell