

## Greenberg reaches 80 as Matveev passes 70



Greenberg

Oscar Wallace "Wally" Greenberg, the theoretician best known for introducing the hidden three-valued colour charge carried by quarks, will celebrate his 80th birthday on 18 February. He continues as an active, full-time faculty member of the University of Maryland in College Park, where he has been since 1961.

Greenberg proposed the idea of colour in 1964 - soon after quarks were introduced - to resolve the paradox that quarks in the supermultiplet of ground-state baryons seemed to violate the Pauli exclusion principle. Because fractionally charged particles had not been observed, quarks with fractional charges seemed highly speculative at the time. Greenberg's suggestion that quarks have a hidden three-valued charge, in addition to having fractional electric charge, seemed completely wild.

Undeterred by the scepticism of many physicists, to provide an experimental test for his proposal Greenberg calculated the pattern of excited states of baryons on the basis of the baryons having Fermi statistics. It took 10 years for data on excited states of baryons to show that his predictions were correct, thus establishing colour charge. Greenberg's work, together with the gauging of the colour charge by Yoichiro Nambu and Moo-Young Han in 1965, provided the foundation for quantum chromodynamics, the current theory of strong interactions and an important component of the Standard model.

Greenberg is also known for proving that local and relativistically covariant quantum field theories must also obey CPT symmetry. He made a systematic analysis of possible quantum statistics in three or more space dimensions and of parastatistics with AML Messiah. He also invented "quons", a type of quantum statistics that interpolates between Bose and Fermi statistics, to provide a theory that can violate the usual statistics in three space-dimensions.



Matveev

Viktor Matveev, director of the RAS Institute for Nuclear Research and director of the Joint Institute for Nuclear Research (Dubna), celebrated his 70th birthday on 11 December.

Matveev has made a number of important contributions in theoretical physics, including the development of methods of quantum field theory for studying high-energy scattering, the description of relativistic composite systems, the formulation of the quark theory of nuclear forces and studies of the effects of quark degrees of freedom in nuclei. He also introduced the notions of hidden colour and quark-counting rules.

As director of INR, Matveev played an important role in the realization of the Baksan and Baikal neutrino observatories and the Moscow Meson Factory at Troitsk. He also actively supports the integration of Russian physics programmes with international ones. He is a member of the Particle and Neutrino Astrophysics and Gravitation International Committee of IUPAP and serves as the chair of the Russia and Dubna Member States Collaboration Board in the CMS project at LHC at CERN.