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Richard Baccante, Treasurer

or numerical inversion of the scattering problem for intensity data measured, for example, in the Fresnel or near-field regime for phase-contrast radiography. In this regard, the synchrotron-based work of Keith Nugent and colleagues at Melbourne University in Australia provides an elegant demonstration for a pure phase object.[2]

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2. See, for example, K. A. Nugent *et al.*, Phys. Rev. Lett. **77**, 2961 (1996).

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Quark 'Color' Clarified

I would like to correct any possible misunderstanding regarding quark "color" that I may have conveyed in my review of Helge Kragh's book *Quantum Generations* (PHYSICS TODAY, May, page 56). O. W. Greenberg's order-three parastatistics (a generalization of Fermi statistics)[1] and Yoichiro Nambu's SU(3)″ group,[2] now called the "color" group, give identical results in the group-theoretical characterization of quark states. The important additional step taken by Nambu was to introduce an octet of gauge fields (now called color gluons) coupled to the color charge. Nambu's SU(3)″ is a local gauge symmetry that is the basis of quantum chromodynamics. I thank Greenberg for calling my attention to a possible misreading of the distinction I was drawing between color as a quantum number and color as a gauge symmetry.

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Learning to Control Quantum Systems

We enjoyed the article in Search and Discovery (PHYSICS TODAY, September, page 24) on our recent work applying coherent control of quantum systems to the topic of x-ray generation. The article does an excellent job of covering recent experimental work in this area. However, we feel it is important to acknowledge that this experimental work was motivated by the suggestions of Herschel Rabitz of Princeton University. Rabitz first proposed, by demonstrating in theoretical simulations, that "learning control" of quantum systems could be applied both to achieve a desired outcome,[1] and as a "probe" to learn more about the system being studied.[2] These early works provided strong motivation for the experimenters to persevere in what we expect to be an exciting new field of "engineered" quantum dynamics. This is also a beautiful example of a case in which engineering concepts, when adapted appropriately, can have fundamental impact in basic physics and chemistry.

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Correction

July, page 23—Ulrich Bonse and his colleagues at the University of Dortmund (Germany) and at the Hamburg Synchrotron Radiation Laboratory at the German Electron Synchrotron (DESY) are also investigating the use of phase-contrast x-ray interferometry for clinical and medical applications.[1] In particular, they have demonstrated the potential of three-dimensional phase-contrast x-ray microtomography using synchrotron radiation. With this technique they have mapped the mass density of nerve and brain tissues in intercranial rat specimens. The experimenters observe a sharp delineation between the two types of tissue as well as clear patterns of nerve fibers. They also see increases in mass density that could identify initial stages of tumor growth.[1]

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2. F. Beckmann *et al.*, Biophys. J. 76, 98 (1999). ■