Fedele Lizzi

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Before that I was at ICTP Trieste, Rutherford laboratory and Syracuse (student with Balachandran)

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Don't worry, I will not tell the whole story, but I want to underline one of my main achievements in NCG, if not the main (or the only):

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Department of Physics-Theoretical Physics, University of Oxford, 1 Keble Road, Oxford OX1 3NP, United Kingdom
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I will tell what I have been doing only from roughly the time we started thinking of this action ~ 2014

Historically I have worked for many years on the Chamseddine-Connes vision of the standard model, usually from a physical point of view, also attempting to go beyond it, which is necessary now that we know the mass of the Higgs. With Devastato and Martinetti we proposed ah higher "Grand Symmetry" which satisfies all of the NCG requirements, but mixes gauge and spin "Lorentz" degrees of freedom

This in turn led to investigate the role of the Wick rotation, and Clifford algebras (also with D'Andrea, Farnsworth and Kurkov). In both the Grand symmetry and the proper treatment of Wick rotation a crucial role is played by the so-called fermion doubling, actually a quadruplication of degrees of freedom which is present in the model, and was initially perceived as a problem, but turned out to be a fundamental aspect.

The Grand symmetry requires a twist of the spectral triple, i.e. the presence of commutators of the kinf $[A, \rho(B)]$ with ρ an automorphism of the algebra. This automorphis turn put to be conjugation with γ^0 and this connects twist with Kreinspace and Lorentz signature, this with Devastato, Farnsworth and Martinetti

I also worked on the connections of the spectral action and ζ-function regularization (Kurkov, Sakellariadou, Watcharangkool)

I have been guilty of some papers on field theory on various noncommutative spaces (beyond Moyal), and recently I worked (with Dimitrievich, Konjik, Kurkov and Vitale) on space with *angular noncommutativity* $\boxed{[x_3, x_1] = i\theta x_2\ ; [x_3, x_2] = -i\theta x_2}$

My latest paper (the best till I finish another one) with Manfredonia, Mercati, Poulain, discusses κ-Minkowski states localizability, and reference frames and observers.

We analysed κ-Minkowski represented on the Hilbert space of square integrable functions on $\mathbb{R}^3$ in analogy with what is done for quantum phase space, but only the noncommuting variables are r and x^0.

To change form the two one needs a Mellin, insted of Fourier, transform, and the theory is such that states can be localised simultaneously in space and time only if at the origin

We discussed also the change of observers, made interesting by the fact that translations do not commute.

Lot of noncommutative gometry, but not only that:

Particles with continuous spin, infrared problems "scent of particle", stochastic variations of fundamental constants