



Wednesday

August 23

4:00 P.M.

Rm 118 NSH

New Terrorism Reveals New Physics

Prof. Neil Johnson

Professor, Director of Complexity Initiative,
University of Miami

In this talk, I will try to convince you that buried in arguably the most urgent challenge facing society, i.e. global terrorism, lies a wealth of interesting physics related to many-body out-of-equilibrium systems, complex dynamical networks, critical phenomena, kinetic theory, and even Green's Functions and Feynman diagrams [1-10]. Moreover there now exist detailed spatiotemporal datasets on global violent events which back up these claims. During the talk, I will try to emphasize the point that this is not just about providing something new for Physics, but rather that Physics is uniquely positioned to offer key insights into this important 'many-person problem' in a way that the traditional disciplines associated with analyzing terrorism can never do.

- [1] N. F. Johnson et al., "New online ecology of adversarial aggregates: ISIS and beyond" *Science* 352, 1459 (2016)
- [2] P. Manrique et al., "Women's connectivity in extreme networks" *Science Advances* 2, e1501742 (2016)
- [3] J. C. Bohorquez et al., "Common ecology quantifies human insurgency," *Nature* 462, 911 (2009)
- [4] N. F. Johnson et al., "Pattern in Escalations in Insurgent and Terrorist Activity," *Science* 333, 81 (2011)
- [5] Z. Zhao et al. "Anomalously slow attrition times for asymmetric populations with internal group dynamics", *Physical Review Letters* 103, 148701 (2009)
- [6] J. P. Onnela et al., "Sampling bias due to structural heterogeneity and limited internal diffusion," *Europhysics Letters* 85, 28001 (2009)
- [7] N. F. Johnson et al., "Bias in Epidemiological Studies of Conflict Mortality," *Journal of Peace Research* 45, 653 (2008)
- [8] Z. Zhao et al., "Effect of social group dynamics on contagion," *Physical Review E* 81, 056107 (2010)
- [9] N. F. Johnson et al., "Human group formation in online guilds and offline gangs driven by a common team dynamic," *Physical Review E* 79, 066117 (2009)
- [10] N. F. Johnson et al., "Simple mathematical law benchmarks human confrontations," *Scientific Reports* 3, 3463 (2013)