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**Samson Abramsky\*** ([samson@comlab.ox.ac.uk](mailto:samson@comlab.ox.ac.uk)), Oxford University Computing Laboratory,  
Wolfson Building, Parks Road, Oxford, OX1 3QD, England. *Relational hidden variables and  
nonlocality.*

We use a simple relational framework to develop the key notions and results on hidden variables and non-locality. The extensive literature on these topics in the foundations of quantum mechanics is couched in terms of probabilistic models, and properties such as locality and no-signalling are formulated probabilistically. We show that to a remarkable extent, the main structure of the theory, through the major No-Go theorems and beyond, survives intact under the replacement of probability distributions by mere relations. In particular, probabilistic notions of independence are replaced by purely logical ones.

We also study the relationships between quantum systems, probabilistic models and relational models. (Received September 21, 2010)