Geometry Seminar
Tuesday, March 3, 2009
Room 317 WWH at 6:00 P.M.

On the Second Half of Boole's Laws of Thought

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Energetica Systems.

George Boole in his Laws of Thought, published in 1854, defined the following problem of estimating an unknown probability given certain data: We are given a finite Boolean algebra B and a subset E of the events of B. We are further given q, a real valued function on E. We wish to find a probability p on B which extends q. In general there are many p which extend q. We wish to find a p which is, in some sense, the natural extension of q. Though probability algebras do not form a variety in the sense of universal algebra, Boole was able to define a unique p by considering B, E, q as generators and relations for the probability algebra B, p.

We present Boole's work, with the help of Theodore Hailperin's translation, and we explain some of the connections between Boole's estimator, Boltzmann's entropy, Fisher's information matrix, Kolmogorov's consistency conditions, the Einstein-Podolsky-Rosen-Bohm circuit, John Bell's first theorem, quantum field theory, the degree of the moment map, and acyclic database schemes.

For more information please visit the seminar website at:
http://www.math.nyu.edu/seminars/geometry_seminar.html.