1079-05-56 **Feliú Davino Sagols*** (fsagols@math.cinvestav.mx), Av. IPN 2508 Col. San Pedro Zacatenco, 07360 Mexico City, Mexico, Mexico, **Javier Muños-Bernabe** (javmunozb@hotmail.com), Av. IPN No, 2508 Col San Pedro Zacatenco, 07360 Mexico City, Mexico, Mexico, and **Charles J Colbourn** (Charles.Colbourn@asu.edu), Po Box 878809, Tempe, Arizona, U.S.A., Tempe, AZ.
Ideals, varieties, stability, colorings and combinatorial designs. Preliminary report.

A combinatorial design is equivalent to a stable set in a suitably chosen Johnson graph, whose vertices correspond to all k-sets that could be blocks of the design. In order to find maximum stable sets of a graph G, two ideals are associated with G, one constructed from the Motzkin-Strauss formula and one reported by Lovász in connection with the stability polytope. These ideals are shown to coincide and form the *stability ideal* of G. Graph stability ideals belong to the class of ideals of boolean rings.

Stability ideals of Johnson graphs provide an algebraic characterization that can be used to generate Steiner triple systems. Two different ideals for the generation of Steiner triple systems, and a third for Kirkman triple systems, are developed. The last of these combines stability and colorings.

We use these approaches in connection to genetic algorithms and the Polybori software to generate big order Steiner Triple Systems. (Received December 12, 2011)