Personal memo from
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David Barnette
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Math
HC / DAVIS

Does buckyball have a Hamilton Circuit?

Greetings!

Polyhedra are back in the news, what with the [buckminster] fullerenes, C clusters of which C_{60} is the prototype. This is the Archimedean truncated icosahedron.

Have you (to your knowledge anyone) ever looked at it for a HC?

My backtrack algorithm of 25 years ago is under 6 feet of dust and as many computer programming languages away; and the complexity might beat it. Perhaps you already know the answer.

No practical implications! But "thinking symmetrical polyhedra" might have advanced the discovery of C_{60} by some 20 years, though more geometry (acceptable bond angles) than topology is at issue. Still, looking ahead, the classification of perturbations and variants of C_{60} could be a daunting challenge.

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more polyhedra.
[or how nasty I am on these elementary details.]. Besides C_{60} what are smaller trivalent polyhedra with no face < 5?

This matters in chemistry: 3- and 4-membered rings are highly strained (but they do exist - there are even some derivatives of cubane: !)

I haven't played at this kind of "mathematics" in a long time. But I'm am back in molecular genetics, and have a small effort in mechanized reasoning in that field as well. I was intrigued by carbon clusters as an issue in chemical origin of life back to the late 50's and it is exciting to see how that field has suddenly exploded!

Sincerely,

Joshua Lederberg

P.S. Do you have a polyhedral ("3D") rendition of C_{38} (non HC)?