What is space?

Discrete cellular space revisited

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Abstract

In this short review, we extend ideas in our preceding paper on possibility that the space consists of discrete cells, which we call "discrete cellular space" model [2]. We argue that it is necessary to solve the continuum problem, albeit it can be compared and expanded by the new theory called *quantum graphity*.

Remark

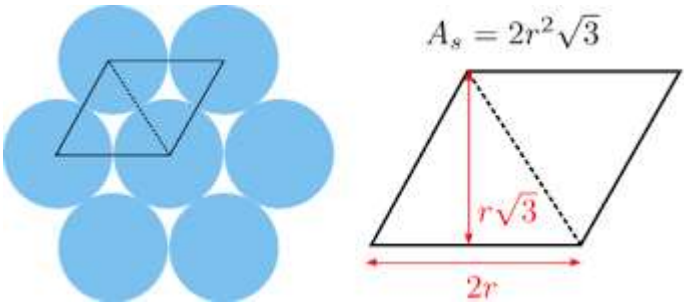
It is known that continuum problem is a fundamental question in theoretical physics: whether the space is discrete or continuous.

This has been discussed for instance in a recent paper [5], which brings forth a new concept called "*quantum graphity."* In essence, what is called quantum graphity is a theorem suggesting that at its smallest scale, the space is composed like discrete graph network. And what is interesting here is that it can be shown that the graph can be a transition to be continuous at sufficient length distance, especially at its low temperature limit. [4]

In the meantime, in our paper [2], we argue in favor of discrete cellular space to solve this continuum problem.

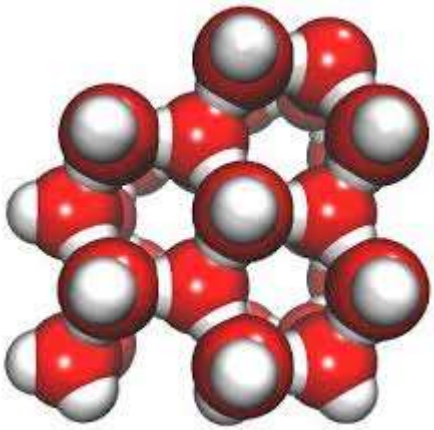
Although our model is far from being complete, it can be connected to a recent paper suggesting that the space is composed of graph at its smallest structure – and it is called quantum graphity.

The idea is to merge those graphs into a network of *dense-packed* cells. That way the space system looks **both as graph network as well as discrete cellular pattern.**

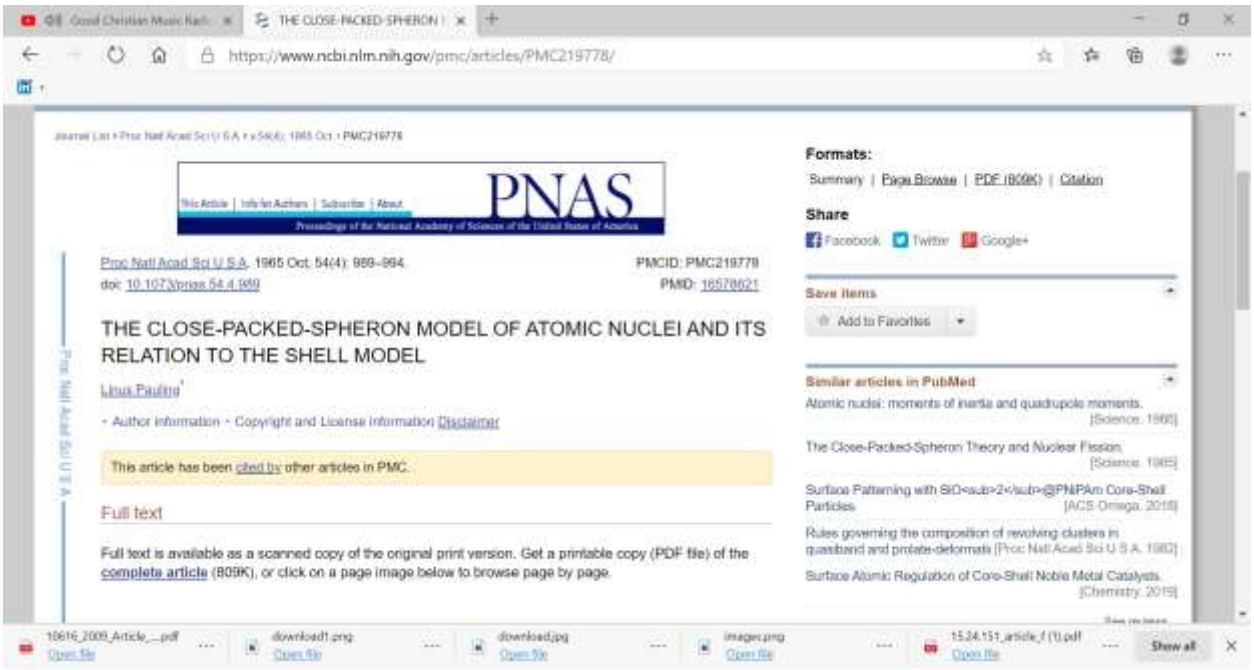


Graph 1. The space is composed of dense-packed discrete cells

In retrospect, this model reminds us to *dense-packed spheron model* of Linus Pauling [1], but this time it goes downward to space structure.



Graph 2. Dense packed spheron [1]



Graph 3. Cover of paper by Linus Pauling [1]

Graph 4. Dense packed spheron of Linus Pauling [1]

Concluding remark

We hope this short remark will lead someday to clearer dense discrete cellular model of space in connection with realistic quantum graphity model.

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