

# Re: kung fu mereotopology

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*Source:* <http://sci.tech-archive.net/Archive/sci.math/2008-12/msg02861.html>

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- *From:* galathaea <[galathaea@xxxxxxxx](mailto:galathaea@xxxxxxxx)>
  - *Date:* Mon, 22 Dec 2008 12:54:25 -0800 (PST)
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On Dec 21, 7:44 pm, Mariano Suárez-Alvarez  
<[mariano.suarezalva@xxxxxxxx](mailto:mariano.suarezalva@xxxxxxxx)> wrote:

On Dec 22, 1:01 am, galathaea <[galath...@xxxxxxxx](mailto:galath...@xxxxxxxx)> wrote:

i find that kontsevich is still working on his own much  
and has a number of "huge" possibilities lurking

much of his stuff on operads  
and graph theory  
and combinatorial topology  
is building some very powerful algebraic tools  
which could potentially crack  $p = np$  among other big questions

Can you point to a sentence of Kontsevich related to  
 $P = NP$ ?

sure  
but i wasn't claiming he actually mentioned such

i was thinking of  
the algebraic approach to computational complexity

things like  
<http://www.math.ntu.edu.tw/talkdata/194/March10.ppt>

and from the development of operad theory  
i've seen much of that computational theory  
transform to the algebraic language

particularly the theory of props in rewriting theory  
has quite some start in such a formalisation

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<http://sigfpe.blogspot.com/2008/10/operads-and-their-monads.html>

<http://blog.mikael.johanssons.org/archive/2008/02/props-and-patches/>

[http://www.atlantis-press.com/php/download\\_paper.php?id=370](http://www.atlantis-press.com/php/download_paper.php?id=370)

and particularly  
the homological theory in computational complexity

kontsevich has been skirting algorithmic complexity  
for some time now with his work on algebraic structures  
over graphs and related combinatorial structures

probably the most suspicious to me is his  
(loosely)

$H(\text{lie algebra}) = H(\text{graph complex}) = H(\text{group})$   
\* \* \*

because the homology of graph complexes  
has some immediate consequences  
for graph isomorphism and the complexity of such algorithms

i have strong suspicions  
that much of the operad theory on which this is built  
(cf. <http://arxiv.org/pdf/math/0211464>)  
contains the kernel of the algebraic concepts  
that could crack complexity questions like  $p =?= np$

additionally  
there is known complexity work  
on poset homology  
that ties their algebraics to more classical work on matroids  
<http://www.springerlink.com/content/y60n827057m374n8/>

kontsevich has contributed quite a bit to matroid theory  
and generally has been working in that netherworld  
of the algebraics of discrete combinatorial structures  
with all the complexity issues just over the horizon

anyway  
my point was that kontsevich has done some major work  
and there is the potential  
for resolving some very big questions

$p =?= np$  is just one example from many  
touched on by his work

like connes' attempts at RH  
it's all conjectured relationships until something is proven

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galathaea: prankster, fablist, magician, liar

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