Computational Materials Physics

Center for Molecular Modeling

Department of Materials Science and Engineering

so what's the problem ?

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http://molmod.ugent.be
http://www.ugent.be/ea/dmse/en
my talks on Youtube: http://goo.gl/P2b1Hs

"The underlying laws for the mathematical theory of most of physics and all of chemistry are completely known."

Paul. A. M. Dirac (1929)

"The underlying laws for the mathematical theory of most of physics and all of chemistry are completely known, and the difficulty lies only in the fact that the exact application of these laws leads to equations much too complicated to be soluble."

Paul. A. M. Dirac (1929)

knowing how to do it

$\neq$

being able to do it

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How 'mature' are different fields of physics ?

The axioms are known and the equations can be solved:
e.g. classical mechanics, classical electromagnetism, thermodynamics,...
an engineering approach is possible

(this does not mean all questions are solved: e.g. long-term future of the solar system)

The axioms are known, but the equations cannot be solved
e.g. condensed matter physics, materials science, chemistry
some 'good fortune' is needed for research progress

The axioms are not known
e.g. nuclear physics
progress is achieved by stumbling trial and error

Goal of this course

A new kind of { materials science / condensed matter physics }

A new kind of materials scientist !

Goal:
Educating you as the first generation of "materials scientists 2.0", who know the tools to bring this new way of doing materials science into practice.