Thoughts on Modules

Modules should have significant E&M content. After all this is the topic we are supposed to be addressing.

Modules should of course be sound pedagogically and should use computation in a way that gives students new insights into the physics.

Modules need to be transferable. This has a number of implications.

People other then the authors should be able to use them to teach with. They should be usable by an "average competent faculty member". Faculty members vary widely in their comfort level with computers and computation. I do not think that modules need to be designed for the lowest common denominator but one should not have to be an expert in computational physics to use a module designed for an intermediate E&M course. Modules designed for a dedicated computational physics can I would think assume a higher level of faculty expertise.

The module should in some sense fit into the standard curriculum. I don't mean that the module can't stretch or alter the curriculum. Jan Tobochnik has suggested that computation makes the example of radiation from an accelerated charge accessible at the undergraduate level which maybe a good example of using computation to stretch the curriculum. But, if the module is too hard to work into the standard curriculum people will not use it.

Ideally a module should be scalable both in terms of length and difficultly so that instructors can adjust the length and level to fit their curriculum and students.

A module should be "transportable across languages". That is a module written to use *Mathematica* should be able to be ported to C++ or Java or vise versa.