MATT BIERBAUM

PHYSICS | SIMULATION | WEB

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EDUCATION

2009 - 2015	**Cornell University** - Ph.D. Physics, advisor James P. Sethna
2009 - 2012	**Cornell University** - M.S. Physics, advisor James P. Sethna
2005 - 2009	**Northwestern University** - B.A. Physics and Integrated Science, advisor Frederic Rasio

RESEARCH

CURRENT

Collective motion in moshpits - describing the phase transition between mosh pit and circle pit
Continuum plasticity - dynamics of line defects in metals using PDEs
Colloidal stresses - developing experimental techniques to measure forces in suspensions
OpenKIM pipeline - developing backend and testing framework for repository of interatomic models
Surface energies - using OpenKIM framework to create broken bond fits to surface energies
Phonon spectra - using symmetries to create small parameter fits for phonon spectra
Smectic A - creation and dynamics of focal conic defects in layered materials

PAST

Zombie disease dynamics - modeling spread of zombieism across the entire US population
Globular cluster dynamics - formation of intermediate mass black holes in primordial clusters
Hidden paintings - using subsurface scattering to infer paintings below the surface

EXPERIENCE

GENERAL

Numerical simulation (PDEs, automata, MC) ‖ High performance computing and GPUs ‖ Constraint satisfaction ‖ Analytical prediction ‖ Data analysis

MAJOR

Python ‖ C / C++ ‖ CUDA ‖ Javascript ‖ Linux ‖ Git ‖ Vim ‖ HTML5 / Canvas ‖ CSS ‖ AWS

MINOR

Web{Sockets,Workers} ‖ SQL ‖ MongoDB ‖ Java ‖ GLSL ‖ GIS ‖ Arduino ‖ Blender ‖ etc

HOBBIES

DAILY

Bicycles - Carbon road, single speed road, single speed mountain bike
Short films / photography - filming, editing, timelapse
Fun physics - cost of a pot hole, physics of bubbles, projects below

PROJECTS

Cupgame chaos - formation of fractals from carnival games ‖ *Plinko simulation* - investigating 'Price is Right' game ‖ *Clicky* - one shared dot for the entire internet ‖ *Onelook* - Ludum dare game uses light as game mechanic ‖ *Billiards* - statistical study of pool shots