

# Marc Henry de Frahan

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## Education

- 2011-present **Ph.D. in Mechanical Engineering**, *University of Michigan*, Ann Arbor, MI  
*Research focus:* Multifluid turbulence in high-energy-density physics  
*Advisor:* Prof. E. Johnsen
- 2009-2011 **M.S. in Applied Mathematics Engineering**, *Université Catholique de Louvain*, Belgium, completed with *High Distinction*  
*Specialization:* Numerical simulation and modeling  
*Thesis:* Implementation of a Discontinuous Galerkin Method for hyperbolic PDEs on GPUs  
*Thesis supervisors:* Dr. J-F Remacle, Dr. P. Chatelain, Dr. V. Legat.
- Fall 2010 **Study Abroad Semester**, *Inst. Nat. des Sciences Appliquées de Toulouse*, France
- 2007-2009 **B.S. in Applied Mathematics Engineering**, *Université Catholique de Louvain*, Belgium, graduated with *Distinction*. *Minor:* Physics
- 2006-2007 **Freshman year Physics major**, *Georgetown University*, Washington D.C, USA

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## Research interests

**Multifluid plasma turbulence, shock-turbulence interaction**  
**High performance computing, graphics processing units**  
**Discontinuous Galerkin method for multifluid flows**  
**Hydrodynamic instabilities in high energy density physics**  
**Computational high energy density plasmas, MHD and multifluid**  
**Material strength models under extreme dynamic loading conditions**

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## Relevant experience

- Summer 2012 **Student Intern**, *Lawrence Livermore National Lab.*, Livermore, CA  
Comparing Beryllium strength models with experimental data  
*Supervisors:* Dr. B. Remington and Dr. R. Cavallo
- May-June 2012 **Long-term Participant**, *Computational Methods in High Energy Density Plasmas*  
Workshop hosted by the Institute for Pure and Applied Mathematics at UCLA
- Summer 2010 **Student Intern**, *Lawrence Livermore National Lab.*, Livermore, CA  
Studied hydrodynamic instabilities in inertial confinement fusion targets  
Characterized growth factors during capsule compression  
*Supervisors:* Dr. L. J. Suter and Dr. D. S. Clark
- Summer 2009 **Student Intern**, *Lawrence Livermore National Lab.*, Livermore, CA  
Studied hot electron signatures and capsule preheat in the context of inertial confinement fusion as developed at the National Ignition Facility  
*Supervisors:* Dr. L. J. Suter and Dr. C. A. Thomas

Summer 2008      **Student Intern**, *Lawrence Livermore National Lab.*, Livermore, CA  
Studied and optimized National Ignition Facility inertial confinement fusion target geometries using view factor calculations  
*Supervisors*: Dr. L. J. Suter and Dr. C. A. Thomas

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## Publications

Marc T. Henry de Frahan and Eric Johnsen. Interface capturing for multifluid simulations with shocks using Discontinuous Galerkin approaches. 2012. submitted.

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## Presentations

M. T. Henry de Frahan, J. L. Belof, R. M. Cavallo, O. Ignatova, E. Johnsen, B. A. Remington, V. Raevsky, Beryllium strength under extreme dynamic loading conditions, APS 54<sup>th</sup> Meeting of the Division of Plasma Physics, Oct. 2012, Providence, RI

M. T. Henry de Frahan, D. S. Clark, L. J. Suter, Hydrodynamic instabilities in inertial confinement fusion targets, WCI Summer Presentation, Sept. 2010, Livermore, CA

M. T. Henry de Frahan, C. A. Thomas, L. J. Suter, Hot electron signatures and preheat, WCI Summer Presentation, Sept. 2009, Livermore, CA

M. T. Henry de Frahan, C. A. Thomas, L. J. Suter, Achieving symmetry without the inner cone, WCI Summer Presentation, Sept. 2008, Livermore, CA

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## Memberships

2012-present      **American Physical Society**, student member

2011-present      **Center for Radiative Shock Hydrodynamics**, *University of Michigan*, student member

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## Awards

**Poster Winner**, LLNL 2012 Summer Poster Session, Livermore, CA

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## Computer skills

Scientific programming      C/C++, C for CUDA, Hydra, Ares, Yorick, ITS Monte-Carlo Codes, OpenMP, MPI, Matlab, Python, Gambit/Fluent, Patran/Nastran

Operating systems      GNU/Linux, Windows

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## Languages

English      **fluent**      *First mother tongue*

French      **fluent**      *Second mother tongue*

Dutch      **proficient**      *6 years in secondary school*