David Aarón Velasco Romero

PERSONAL INFORMATION

- Nationality: Mexican
- Birth date: May 2nd, 1987
- Birth place: Guadalajara, Jalisco, México.
- Mail: david.velasco@princeton.edu
- Telephone number (cell phone): +1 609 255 4871
- Orcid: `https://orcid.org/0000-0002-6093-891X`
- Github: `https://github.com/davidvelasco07`
- Website: `https://davidvelasco07.github.io`

EMPLOYMENT

Postdoctoral Researcher, *Department of Astrophysical Sciences, Princeton University* *2022-present*

- *Supervision of Bachelor Students: Sajia Shahrin Neha, Xander Jenkin*

Postdoctoral Researcher, *Institute for Computational Science, University of Zurich* *2019-2022*

- *Organizer of the Computational Sciences seminar*
- *Lecturer in the High Performance Computing course at UZH (Spring of 2020/2021)*
- *CSCS Production Project: Three-dimensional study of multi-fluid dust dynamics in protoplanetary disks with embedded low-mass planets. Granted 350,000 node hours at the GPU partition of Piz-Daint as the Principal researcher (PI)*

EDUCATION

PhD in Computational Modelling and Scientific Computing
UAEM, Cuernavaca Morelos, México *2015-2019*

Thesis (Honorable mention): Development of various numerical methods over GPUs and their application to astrophysical environments.

Grants:

- *Swiss Government Excellence Scholarship: 1 year fellowship at the University of Zurich*
- *CSCS Preparatory Project: Discontinuous Galerkin methods on GPUs for planetary formation*

Master in Science (Physics)
Instituto de Ciencias Físicas UNAM, Cuernavaca Morelos, México *2011-2014*
Grade: 8.8/10
Thesis: Analysis of the behavior and robustness of an infotactic searcher against uncertainty in the parameters of the signal.

BSc in Physics
Universidad de Guadalajara, CUCEI *2006-2010*
Grade: 94.86/100

SCIENTIFIC CODES

Public:

- `https://bitbucket.org/david_velasco/dg2d/`
- `https://bitbucket.org/david_velasco/ramses-dust/`
- `https://github.com/davidvelasco07/sd3d`

Non public (for the time being):

- `FARGO3D`+*Nested-Meshes*
- `FARGO3D`+*Multi-fluid+Nested-Meshes*
- *Spectral Differences: 2D MHD+Well-balanced.*

RESEARCH AREAS OF INTEREST

- *Computational Fluid Dynamics.*
- *Computational Astrophysics.*
- *High-Performance Computing.*
- *Parallel and GPU programming.*
- *High-order methods*

PUBLICATIONS

Frédéric Masset & David A. Velasco Romero.
Dynamical friction on hot bodies in opaque, gaseous media.
MNRAS, 2016. `https://doi.org/10.1093/mnras/stw3008`

Jeffrey Fung, Frédéric Masset, Elena Lega & David Velasco.
Planetary Torque in 3D Isentropic Disks.
AJ, 2017. `https://doi.org/10.3847/1538-3881/153/3/124`

David A. Velasco Romero, Maria Han Veiga, Romain Teyssier & Frédéric Masset.
Planet–disc interactions with discontinuous galerkin methods using GPUs.
MNRAS, 2018. `https://doi.org/10.1093/mnras/sty1192`

David A. Velasco Romero & Frédéric Masset.
Numerical study of dynamical friction with thermal effects – I. Comparison to linear theory
MNRAS, 2019. `https://doi.org/10.1093/mnras/sty3382`

Maria Han Veiga, David A. Romero Velasco, Rémi Abgrall & Romain Teyssier.
Capturing near-equilibrium solutions: a comparison between high-order discontinuous Galerkin methods and well-balanced schemes
Commun. Comput. Phys., 2019. `https://doi.org/10.4208/cicp.OA-2018-0071`

David A. Velasco Romero & Frédéric Masset.
Dynamical friction with radiative feedback – II. High-resolution study of the subsonic regime
MNRAS, 2020. `https://doi.org/10.1093/mnras/staa1215`

Maria Han Veiga, David A. Romero Velasco, Quentin Wenger & Romain Teyssier.
An arbitrary high-order Spectral Difference method for the induction equation
JCP, 2021. `https://doi.org/10.1016/j.jcp.2021.110327`

David A. Velasco Romero, Frédéric Masset & Romain Teyssier.
Eccentricity driving of pebble accreting low-mass planets
MNRAS, 2022. `https://doi.org/10.1093/mnras/stab3334`

David A. Velasco Romero, Maria Han Veiga & Romain Teyssier.
Spectral Difference method with** a posteriori **limiting: Application to the Euler equations in one and two space dimensions
submitted to MNRAS, 2022. `https://arxiv.org/abs/2209.06597`

CONFERENCES

1. *Summer School*
   Parallel Computing and GPU's, Instituo de Ciencias Físicas, UNAM. Cuernavaca, Morelos *2014*
2. *Workshop*
   Accelerated High-Performance Computing in Computational Sciences, International Center for Theoretical Physhics, Trieste *2015*
3. *Workshop*
   Introduction to Programming Pascal (P100) with CUDA 8, CSCS, Lugano *2017*
4. *Conference*
   Carving through the Codes: Challenges in Computational Astrophysics, Davos *2017*
5. *Conference*
   PASC17, CSCS, Lugano *2017*
6. *Workshop*
   Numerical Simulations of Planet-Disc Interactions, Cuernavaca, Morelos *2017*
7. *Workshop*
   RUM (RAMSES User Meeting) 2019, Copenhagen, *2019*
8. *Workshop*
   Multi GPU Training with TensorFlow on Piz Daint, Online, *2020*
9. *Conference*
   Circumplanetary Disks and Satellite Formation, Online *2021*

PROGRAMING SKILLS

Proficient: C, C++, Fortran, Python, CUDA, MPI
Working experience: Assembly

LANGUAGES

- *English:* Proficient.
- *Spanish:* Native language.

PROFESSIONAL REFERENCES

- *Dr. Frédéric Sylvain Masset; masset@icf.unam.mx*
- *Dr. Romain Teyssier; teyssier@princeton.edu*
- *Dr. Lucio Mayer; lmayer@physik.uzh.ch*