

DIEGO FAZI, Ph.D.

Education

Università degli Studi di Bologna / California Institute of Technology (Caltech); Ph.D. in Physics (2009)

GPA equivalent: 4.00/4.00

Major: Theoretical Physics and Mathematical Methods

Thesis Title: *Development of a physical-template search for gravitational waves from spinning compact-object binaries with LIGO*

Thesis Subject: The Laser Interferometer Gravitational-Wave Observatory (LIGO) is one of the most technologically advanced astrophysics experiments in the world, that aims at understanding the fundamental laws governing the most extreme events in the universe. My research focused on the detection of colliding black holes and I developed theoretical and computational tools to study their properties.

Awards:

- Italian Education Ministry Fellowship - \$44,528 (2005-2008)
- LIGO-Caltech research fellowship - \$36,000 (2005-2008)
- Caltech-TAPIR research fellowship - \$34,800 (2008-2009)
- Honorable mention for the 2009 *Gravitational Wave International Committee* (GWIC) Ph.D. Thesis Prize

Università degli Studi di Bologna; B.S. and M.S. (Laurea) in Physics (2004)

GPA equivalent: 3.95/4.00

Major: Nuclear and Subnuclear Physics

Thesis Title: *Gravitational collapse of a radiating shell composed of charged bosonic matter*

Thesis Subject: I developed a theoretical and computational model to study the final stages of a star's life and predict what happens when the star collapses under the pull of its own gravitational field. Results from this work are important to understand intense radiation emissions in the universe known as *gamma ray bursts*.

Awards:

Summa Cum Laude (110/110 with Maximum Honors) (2004)

Work Experience

Argonne National Laboratory (2015-present)

Technology Innovation Strategist

- Working with the Strategy Innovation Office to help identify technologies developed at Argonne which have high commercial potential
- Developing a comprehensive portfolio of opportunities and resources for market analysis and commercial development available to Argonne's projects
- Devising strategies to facilitate the commercialization of promising technologies and to determine the most appropriate resources and programs for each project
- Establishing and leveraging relationships with institutions and organizations dedicated to technology innovation and commercialization, both in the Chicago area as well as at the regional and national level
- Providing support and guidance to Argonne's projects through the commercialization process

Argonne National Laboratory and Argonne-Northwestern Solar Energy Research Center (ANSER) (2012-2015)

Postdoctoral Appointee

- Created novel materials (catalysts) that use solar energy to produce clean hydrogen fuel from water
- Studied the catalysts' molecular structure through x-ray experiments to improve their functionality and optimize their performance for hydrogen-production
- Developed innovative parallel-computing software to automatically compare data with structural models, with a speed-up of ~1,000,000 with respect to standard techniques

Northwestern University and Center for Interdisciplinary Exploration and Research in Astrophysics (2009-2012)
Postdoctoral Fellow

- Implemented and tested a new data analysis strategy (ANSI C) to search for gravitational wave signals in large data sets, providing an increase in detection efficiency of up to 100% with respect to standard techniques
- Contributed developing a Markov Chain-Monte Carlo (MCMC) Bayesian code for parameter estimation of gravitational-wave astrophysical sources
- Led and coordinated 6-person research team within the LIGO-Virgo Collaboration (LVC) data analysis group
- Presented research results to the audience of the LVC (800 scientists) and at various conferences/symposia
- Awarded grant for 764,640 CPU hours on Northwestern's Quest supercomputer as Principal Investigator

California Institute of Technology, Department of Physics (2005-2009)
Visiting Research Scholar (2005-2009) - Postdoctoral Fellow (2009)

- Wrote computer code to model signals emitted by black-hole binaries and integrated it in a large software library used by more than 800 scientists of the LIGO-Virgo collaboration
- Developed advanced data-analysis computational tools currently used in the search for gravitational-waves by the LIGO-Virgo collaboration
- Performed data analysis on high-performance supercomputers at Caltech and the Max Planck Institute (Germany)
- Self-taught C and Matlab programming for high-performance scientific applications

Technology Innovation and Commercialization

Argonne LabCorps Program (2015-present)

Entrepreneurial Lead

- Providing leadership in customer discovery and market analysis for Argonne developed technology FSCC
- Won the first prize at the Argonne pitch competition and awarded a \$75,000 grant to advance in the LabCorps national program.

Cleantech Open (2014-present)

Chicago Metro Director

- Coordinating recruiting and programs for the 2015 Cleantech National Accelerator for the Chicago area
- Coordinated events related to the cleantech National Accelerator Program 2014, including the Chicago Business Clinic (August 2014) and the Midwest Innovation Summit (October 2014)
- Facilitating interaction between researchers, entrepreneurs and investors in the Chicago area
- Supporting startups taking part in the National Accelerator Program
- Entrepreneur and mentor recruitment and engagement
- Summer Academy, business clinics and workshops focused on building high-tech businesses
- Investor networking, semifinal and finals judging programs
- Regional and National awards events – the “Academy Awards of Cleantech”

Startup Consultant

Providing technical advice and mentorship to cleantech startups, serving as mock judge

Clean Energy Trust (2014/2015)

Startup Mentor and Technical Consultant

- Providing technical and business support to cleantech startup *FGC Plasma*, winner of the "U.S. Department of Energy Student Prize" (\$50,000) and the "Aviation Clean Energy Award" (\$50,000) at the Clean Energy Challenge 2015, for a total of \$100,000 in prizes.
- Provided technical and business support to cleantech startup *MyPower* (now *AMPY*), winner of the Consumer Favorite Prize (\$75,000) at the 2014 *Clean Energy Challenge*

Chicago Innovation Exchange (2014)

Innovation Fund Associate

- Performed due diligence and market analysis for education startup *MyPath*
- Provided assistance in developing a business model and commercialization strategy

- Provided feedback and guidance in preparing an effective business pitch to deliver to the Advisory Committee (AC)
- Presented a compelling diligence analysis to the AC which contributed to secure a \$100,000 award from the Innovation Fund

UIC Institute for Entrepreneurial Studies

(2014)

Student Team Mentor

Advised students participating in the *Bold Idea Generation Weekend: All Things Green!* on how to turn a green idea into a business plan.

Postdoctoral Society of Argonne

(2012-2015)

Board Member and Initiator of the discussion group on *Entrepreneurship and Technology Commercialization*

- Fostering collaborations between Argonne and the Cleantech Open and coordinating the establishment of a partnership for the 2014 and 2015 Cleantech Open National Accelerator Program
- Organizing professional development workshops and events about Technology Innovation and Commercialization, partnering with local organizations like the Chicago Innovation Exchange, the Energy Foundry and experts like Prof. Nik Rokop at IIT

Business and Professional Training

Cleantech Open;

- *Summer Business Clinic: Chicago, Business Bootcamp* (August 27, 2014)
- *2014 East Coast Academy, Business Bootcamp* (June 17-18, 2014)

Clean Energy Trust; *Startup Sessions, Workshop* (December 4, 2013)

Argonne National Laboratory;

- *Marketing for Scientists, Workshop* (June 19, 2013)
- *10 Best Practices for Proposal Success, Workshop* (March 13, 2013)
- *Elements of Effective Mentoring, Workshop* (March 1, 2013)

Kellogg School of Management; *2012 Challenges for Electricity Markets, Workshop* (May 4-5, 2012)

The University of Chicago;

- *Life Cycle Analysis of Energy Systems using the GREET Model, Workshop* (May 18, 2012)
- *Energy and Environmental Systems Analysis using Agent-Based Modeling, Workshop* (February 24, 2012)

Technical Training

2015 IEEE International Conference on Electro/Information Technology (Northern Illinois University), *Microgrid Design and Implementation, Workshop* (May 22, 2015)

Argonne National Laboratory; *Introduction to MPI (Message Passing Interface), Workshop* (June 6, 2014)

Northwestern University; *Petascale Programming Environments and Tools On-site, Workshop* (July 6–9, 2014)

European Gravitational Observatory (EGO); *Virgo-EGO Science Forum (VESF) School for Gravitational Waves, Workshop* (May 22-26, 2006)

Leadership Experience

Midwest Postdoctoral Forum

(2013-2015)

Co-founder and Board Member

- Co-founded and started a collaborative platform for postdoctoral researchers in the Midwest, with groups on LinkedIn and Facebook with over 50 members from more than 10 institutions
- Organizing an annual symposium for postdoctoral research scientists to be held at different member institutions in the Mid-West with an average attendance of 100 postdocs

Postdoctoral Society of Argonne

(2012-2015)

Board Member, Initiator and Member of the Mentoring Committee

- Initiator of a discussion group on “Entrepreneurship and Technology Commercialization”
- Proponent and co-writer of the Argonne Outstanding Postdoctoral Mentor Award, and member of the award selection committee
- Argonne's representative within the National Postdoctoral Association (NPA)

Citizens' Greener Evanston

(2010-2012)

Board Member and Member of the Education and Outreach Committee

- Initiator of the Evanston chapter of Green Drinks International
- Organized and hosted 15 public events about sustainability with average 30 people attendance

Invited Presentations

- *Structural and Functional Characterization of Amorphous Metal-oxide Water-splitting Catalysts Using High Energy X-ray Scattering combined with Pair Distribution Function Analysis*, Iowa State University (June 10, 2013)
- *From Gravitational Waves to Solar Fuels: Data Analysis Techniques*, Argonne National Laboratory, (June 15, 2012)
- *Physical Templates in the Search for Gravitational Waves from Spinning Compact-Object Binaries with LIGO*, Virgo Gravitational Observatory, Italy (January 20, 2010)
- *Search for gravitational waves from spinning binaries in LIGO data using a new family of Physical Templates*, Università degli Studi di Bologna, Italy (January 15, 2008)
- *LIGO and the search for gravitational waves from spinning binaries*, Università degli Studi di Bologna, Italy (January 11, 2007)

Talks and Poster Presentations

- *Structural and Functional Characterization of Amorphous Metal-oxide Water-splitting Catalysts Using High Energy X-ray Scattering combined with Pair Distribution Function Analysis*, 2013 APS/CNM/EMC Users Meeting Argonne National Laboratory, Lemont, IL (May 7th, 2013)
- *Evidence for Spin in Compact Binary Coalescence: when can we trust it?*, AAS Meeting, Austin - January 8th, 2012
- *Re-Purposed MCMC for Low-Latency Sky Localization of Gravitational Wave Sources*, AAS Meeting, Austin, TX (January 8th, 2012)
- *Development of a search for gravitational waves from spinning compact-object binaries with ground-based interferometers*, Midwest Relativity Meeting, University of Illinois, Urbana Champaign, IL (November 4th 2011)
- *A data-analysis pipeline deploying Physical Single-Spin Templates in the Search for Gravitational Waves from Spinning Compact-Object Binaries with LIGO*, GWPAW conference, UWM (January 26th, 2011)
- *Physical Templates in the Search for Gravitational Waves from Spinning Compact-Object Binaries with LIGO*, GWDAW Conference 2010, University “La Sapienza”, Italy (January 27th, 2010)
- *Investigating the benefits of using the PTF spinning search*, Amaldi8, Columbia University, (June 21, 2009)
- *Searching for gravitational waves from spinning binaries in LIGO data using a Physical Template Family*, Pacific Coast Gravity Meeting (PCGM), UC Santa Barbara (March 22, 2008)

Memberships in Professional & Scientific Societies and Other Professional Activities

- Serving as Subject Matter expert for Argonne's Laboratory Directed Research and Development (LDRD) program (2014-present)
- Member of the American Physical Society, (2007-present)
- Member of the National Postdoctoral Association (NPA) (2014-2015)
- Board Member of the Postdoctoral Society of Argonne (PSA) (2012-2015)
- Member of the LIGO-Virgo Scientific Collaboration (LVC), (2005-2012)

Public Appearances, Outreach and Mentoring

Science Magazine, Interviewed by Alaina Levine and featured in article "*Postdocs 2: transitioning to new fields*", sharing my experience as a postdoc transitioning from Gravitational-Wave Astronomy to the Solar Energy field. (June, 2015)

Chicago Tribune, Interviewed by John Carpenter and featured in article "*Two Argonne teams each win \$75,000 in new Lab-Corps pitch competition*", following the award of the first place at the Argonne LabCorps pitch competition, (April 17, 2015)

LIGO Magazine, *Life after LIGO*; contributed with an autobiographic statement about my career as an astrophysicist within the Laser Interferometer Gravitational-Wave Observatory and my subsequent experience as a scientist in the solar energy field at Argonne (August, 2014)

Argonne National Laboratory, *Path to Success*; mentored undergraduate students on research careers in academic environments (July 10, 2013)

Argonne National Laboratory Postdoctoral Blog; published the article *Mentoring, networking and navigating careers* (April 17, 2013)

Roosevelt Elementary School Science Fair; hosted the interactive booth *Exoplanets: Could there be other habitable worlds out there?* (December 2, 2011)

Film and Television Critics Award (Italy); presented self-produced video about my personal experience as a researcher living abroad (July 3, 2011)

Patch.com, *Environmentalists Encourage Road Diets*; released an interview about the August *Green Drinks* event on *Sustainable Transportation* which I organized at the Firehouse Grill in Evanston (August 9, 2011)

Medill Reports Chicago; released an interview and commentary on the article *Twisting of light around rotating black holes* appearing in *Nature* (February 17, 2011)

L'Azione newspaper (Italy); released an interview about my research on gravitational waves and its impact on science and everyday life (December 5, 2009)

Additional Information

Languages: Italian (native), English (fluent), French (conversational), Spanish (basic)