

ALEJANDRO VIGNA-GÓMEZ

ADDRESS

Dark, Niels Bohr Institute
University of Copenhagen
Vibenshuset, Lyngbyvej 2, 4. sal
2100 Copenhagen, Denmark

CONTACT

avignagomez[at]nbi.ku.dk
Skype: alejandro.vigna

DARK Fellow

Oct 2019 – Present

EDUCATION

University of Birmingham

PhD. in Physics and Astronomy

Supervisor: Ilya Mandel

Oct 2015 – Sep 2019

Universidad Autónoma de San Luis Potosí

BS Physics (Hons). 9.25/10.00

Aug 2011 – Apr 2015

RESEARCH EXPERIENCE

Study of various transient astronomical phenomena which occur in field binaries, such as X-ray binaries (e.g. HMXBs, BeXs), common envelope events (e.g. luminous red novae), supernovae (PISN) and gravitational waves. I'm particularly interested in systems which will become double neutrons stars similar to the ones observed in the Galaxy, as well as double compact object mergers, such as the ones detected by aLIGO/VIRGO. I develop and use COMPAS, a population synthesis code, to study different evolutionary stages of binary evolution. I led a population synthesis study on **Galactic DNSs**. I also use MESA for detailed modeling of **(P)PISN** progenitors.

TEACHING EXPERIENCE

School of Physics and Astronomy, University of Birmingham

Mathematics for Physicists 2

2015–2016, 2016–2017

Qualitative and quantitative feedback to the work of a class of 40+ group of 2nd year undergraduate students.

Gravitational-wave Astrophysics

2017–2018

Closely worked as co-supervisor of a 10+ group of 3rd year undergraduate students. The group worked on a collaborative research project focussed on analysis of gravitational-wave signals, their astrophysical progenitors and detectability.

Facultad de Ciencias, Universidad Autónoma de San Luis Potosí

Electromagnetism

Spring 2015

Teaching assistant of a 1st year undergraduate class. I was in charge of organising the problem sessions and course examinations.

Linear Algebra

Fall 2014

Substitute teacher of a 2nd year undergraduate class. I was also in charge of grading the course examinations.

Dynamics Fall 2013
Substitute teacher of a 2nd year undergraduate class. I was also in charge of grading the course examinations.

MENTORING EXPERIENCE

School of Physics and Astronomy, University of Birmingham

M. Wassink (visiting from Radboud University). Masters project. 2019
S. Kingdon & A. Perry. Masters project. 2017–2018
M. Lau. (visiting from Oxford University). Masters project. 2018–2019
S. Shortt (visiting from Georgia College and State University). Summer project. 2018
E. Butler. Summer project. 2018
K. Boyett & F. Gittins. Masters project. 2016–2017
K. Nathaniel (visiting from Virginia Tech). Summer project. 2017
I. Romero-Shaw. Summer project. 2017
M. Brown & R. Sathyaprakash. Masters project. 2015–2016
D. Perkins. Summer project. 2016

JOB EXPERIENCE

Instituto de Física, Universidad Autónoma de San Luis Potosí

Research Assistant: Cold Atoms Laboratory 2012–2014
Assembly and testing of a radio frequency amplifier. Assembly of experimental setup of laser locking circuit through RF in order to perform Raman transitions on Rubidium 87.

Research Assistant: Theoretical Physics Group 2014–2015
Assistance in graphics modeling and computational analysis. General assistant to research and academical matters.

University of California Santa Cruz, Santa Cruz, California

Visiting Scholar: Astronomy & Astrophysics Department Summer 2014, Summer 2013
Study of relativistic bow shocks produced by gamma-ray burst progenitors. Numerical simulations made in order to analyse geometry, internal energy distribution, emitted flux and general properties of these systems.

INVITED SPEAKER CONFERENCES

Frontiers of the Physics of Massive Stars

Ensenada, México Jul 2018

CONFERENCES AND WORKSHOPS

Simulating Stars Summer School

Beijing, China Jun 2018

Teaching assistant to Manos Chatzopoulos

Deciphering the Violent Universe

Playa del Carmen, Mexico Dec 2017

Conference Talk

Kavli Summer Program in Astrophysics

Niels Bohr Institute and DARK Cosmology Centre, Copenhagen	Jul–Aug 2017
Student Fellow, Talk	
Binary Stars in Cambridge	
University of Cambridge, Cambridge	Jul 2016
Conference Talk	
“Look & Listen” Astrophysics School	
Playa del Carmen, Mexico	Jan 2014
Student Fellow	

TALKS, SEMINARS and COLLOQUIA

Astrophysics Colloquia

University of Melbourne, Melbourne	Aug 2019
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MoCA Seminar

Monash University, Melbourne	Aug 2019
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Stellar Group Meeting (SINS)

Monash University, Melbourne	Jul 2019
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Avi Loeb’s ITC Group Meeting

Harvard, Boston	Dec 2018
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GRITTS Seminar

Massachusetts Institute of Technology, Boston	Dec 2018
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OUTREACH TALKS

Astronomy in the City , University of Birmingham	Jan 2018
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Talk to a general public audience (300+ assistants). Astronomy in the City is aimed at secondary school age and above (Year 7+).

Science Seminar of the Mexican Society , University of Birmingham	Oct 2017
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Talk to an audience of approximately 30 researchers and students from different disciplines.

AWARDS, GRANTS & HONOURS

PHAROS COST Action STSM Grant	2018
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KAVLI Summer Program in Astrophysics Student Fellow	2017
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Universitas 21 PhD Scholarship	2017
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CONACYT Fellowship Recipient	2015-2019
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John N. Bahcall Award in Physics	2013
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TECHNICAL SKILLS

Languages

C, C++, Fortran90, Python, LaTeX

Software

MATLAB, Mathematica, AMR SRHD Mezcal Code, MESA

LANGUAGES

Spanish - Native Language

English - Advanced