Ileyk El Mellah

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French citizen

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Education

2013-16 **PhD supervised by Fabien Casse & Andrea Goldwurm on** ***Numerical simulations of wind accretion onto compact bodies***
AstroParticule & Cosmology laboratory (APC) - Univ. of Paris 7 Diderot

2012-13 **Master degree in Astrophysics** - Observatory of Paris
Obtained with distinction

2010-12 **Normalien at the *Ecole Normale Supérieure* of Cachan**

2011-12 **Research internship and graduate courses** - MIT, Cambridge

2010-11 **French *Agrégation* of Physics & Chemistry** - ENS of Cachan, FR
Rank : 2nd in 1,409 candidates

2008-10 **Bachelor degree in Fundamental Physics** - ENS / Paris 6 University
Obtained with honours

2006-08 **Preparatory classes to *Grandes Ecoles*** - Lycée Janson-de-Sailly, Paris

Research

Since 2016 **FWO [Pegasus]^2 Marie Skłodowska-Curie fellowship under the supervision of Rony Keppens**
Center for mathematical Plasma Astrophysics - KU Leuven

2013-16 **PhD thesis supervised by Fabien Casse & Andrea Goldwurm on** ***Numerical simulations of wind accretion onto compact bodies***
APC - Univ. of Paris 7 Diderot

2011-12 **One-year internship supervised by Saul Rappaport on** ***Monitoring of close-in binary stars and short period exoplanets***
Data analysis and models of light curves from the Kepler satellite
Kavli Institute for Astrophysics - MIT

Ap-Ag 2010 **Internship supervised by Jean-François Lestrade on** ***Gravitational perturbations of debris discs by a passing-by star***
LESIA - Paris Observatory

Jn-Jl 2009 **Internship supervised by Gérard Belmont & Patrick Robert on** ***Resampling of the CLUSTER satellites data***
Plasma Physics Laboratory - Vélizy

Communications

Peer-reviewed publications

[1] **El Mellah I.**, Sundqvist J. O. & Keppens R.
Accretion from a clumpy massive-star wind in Supergiant X-ray binaries (2017)
under reviewing

[2] Grinberg V., Hell N., **El Mellah I.**, Neilsen J., Sander A. A. C., Leutenegger M. A., Fürst F., Huenemoerder D. P., Kretschmar P., Kühnel M., Martínez-Núñez S., Niu S., Pottschmidt K., Schulz N. S., Wilms J. & Nowak M. A.
The clumpy absorber in the high mass X-ray binary Vela X-1 (2017) - A&A

[3] Xia C., Teunissen J., **El Mellah I.**, Chané E. & Keppens R.
MPI-AMRVAC 2.0 for solar and astrophysical applications (2017) - under reviewing

[4] **El Mellah I.** & Casse F.
A numerical investigation of wind accretion in persistent Supergiant X-ray Binaries I - Structure of the flow at the orbital scale (2016) - MNRAS

[5] **El Mellah I.** & Casse F.
A numerical simulations of axisymmetric hydrodynamical Bondi-Hoyle accretion on to a compact object (2015) - MNRAS

[6] Sanchis-Ojeda R., Rappaport S., Winn J., Kotson M., Levine A., **El Mellah I.**
The shortest-period planets found with Kepler (2014) - ApJ

[7] Rappaport S., Deck K., Levine A., Borkovits T., Carter J., **El Mellah I.**, Sanchis-Ojeda R., Kalomeni B.
Triple-star candidates among the Kepler binaries (2013) - ApJ

[8] Rappaport S., Levine A., Chiang E., **El Mellah I.**, Jenkins J., Kalomeni B., Kite E. S., Kotson M., Nelson L., Rousseau-Nepton L., Tran K.
Possible disintegrating short-period super-Mercury orbiting KIC 12557548 (2012) - ApJ

Proceedings and PhD manuscript

[9] **El Mellah I.**, Sundqvist J. O. & Keppens R.
Clumpy wind accretion in Supergiant X-ray binaries (2017) - SF2A

[10] **El Mellah I.**
Wind accretion onto compact objects (2017) - PhD manuscript

[11] **El Mellah I.** & Casse F.
Numerical simulations of Bondi-Hoyle accretion onto a compact object (2015) - SF2A

Communications

Oral contributions[a]

Dc 2017	Radboud University Nijmegen - seminar*
Sp 2017	Observatory of Paris - seminar*
Sp 2017	KU Leuven - Frontiers of Astrophysical Modeling
Ag 2017	Köln - Numerical techniques in MHD simulations
Jl 2017	Paris - Journées de la SF2A
Mr 2017	Brussels Royal Observatory - CHARM meeting
Sp 2016	Arbatax - Super-Eddington accretion on compact objects
Sp 2016	Aarhus University - seminar*
Ap 2016	Paris 7 University - seminar*
Ap 2016	KU Leuven - seminar*
Oc 2015	AIM laboratory (CEA, Paris) - Computational Astrophysics meeting
Jn 2015	Toulouse - Journées de la SF2A
Mr 2015	Ecole des Houches - Turbulence, magnetic fields and self organization

Posters

Jn 2017	**Clumpy wind accretion in Supergiant X-ray binaries** EWASS - Prague
Dc 2015	**Numerical simulations of wind accretion onto compact objects** Texas symposium - Geneva
Nv 2014	**Numerical simulations of wind accretion undergoing flip-flop instability** IAP - Paris

[a]The stars indicate an invited talk.

Teaching & outreach

Teaching

2016-17	**Computational methods for Astrophysics, 5th year** - KU Leuven
2014-16	**Classical Mechanics, 1st year** - Univ. of Paris 7 Diderot
2013	**Physics for Medical studies, 1st year** - Univ. of Paris 7 Diderot
2013	**Deterministic systems and signals, 4th year** - Univ. of Paris 7 Diderot
2012-13	**Private lessons with the company *Cours Thalès*** - Paris
2011	**French *Agrégation* of Physics & Chemistry**
2009-10	**Teaching assistant at the high school Gustave Eiffel** - Cachan

Outreach

Oc 2017	**Radio show *Faconde* on scientific outreach** - Brussels
Ap-Nv 2015	**Community manager of the Young Physicists Meeting** - Paris
Oc 2015	**Festival of Science** - Univ. of Paris 7 Diderot
Sp 2015	**Wolfram demonstration on the ballistic motion in a Roche potential and 3D-printing of the corresponding surfaces** - APC
2013	**Java applet on Turing theory of morphogenesis** - Paris Observatory

Grants & awards

2017	**Computing time on the Tier-1 VSC cluster : 1 Mh·CPU**
2016	**3-years FWO [Pegasus]^2 Marie Skłodowska-Curie fellowship**
2016	**Computing time on the CINES cluster : 300 kh·CPU**
2015	**Computing time on the CINES cluster : 300 kh·CPU**
2013	**3-years PhD fellowship from the Ecole Normale Supérieure of Cachan**
2013	**3-years teaching assistant grant from the Université of Paris 7 Diderot**
2012	**1-week observing time at the Mont Mégantic Observatory (Canada)**
2011	**French *Agrégation* of Physics and Chemistry - Rank : 2nd / 1,409**
2010	**2-years fellowship from the ENS of Cachan as a *normalien***

Selected skills

Programming languages
Fortran, C, C++, **Python**, Idl, Java, Perl, XML, **Csh**, Bash, **HTML**, **CSS**, JavaScript, CoffeeScript, HTML5

Codes & softwares
MPI-AMRVAC, Mathematica, VisIt, Paraview, Vampir, VampirTrace, Atom, Emacs, Pyke, Inkscape, Gnuplot, DS9

Data analysis
Extended Fourier and wavelet analysis, resampling and interpolation of time/space series

Languages
French (native), English (fluent), Italian (B1)