Nicola Pietro Gentile Fusillo **Born 7th July, 1988, Italy**

CONTACT INFORMATION

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RESEARCH INTERESTS

Observational astronomy, large-scale identification and characterization of white dwarfs (e.g. magnetism, variability, metal-pollution), planetary remnants, wide-area optical and infrared surveys.

EDUCATION

University of Warwick, Coventry, United Kingdom **October, 2011 - September, 2015**

PhD, Astrophysics

- Topic: "Stellar and planetary remnants in large area surveys."
- Supervisor: Prof. Boris Gänsicke

University of Warwick, Coventry, United Kingdom **October, 2007 - June, 2011**

MPhys. Thesis topic: "Optical transients in the WASP orphan database"

HONORS AND AWARDS

European Southern Observatory Fellowship (Garching) for the years 2019-2022.

WORK AND ACADEMIC EXPERIENCE

Research Fellow **October, 2019 - ongoing**
European Southern Observatory, Garching bei München, Germany
Large scale identification and characterization of white dwarf using Gaia. Discovery and analysis of planetary remnants around white dwarfs. Selection and characterization of white dwarfs as flux standards for next generation optical and IR survey/instruments. Development of white dwarfs pipeline for 4MOST and SDSS V

Postdoctoral research Assistant **August, 2016 - September 2019**
University of Warwick, Coventry, UK
Working on several aspects of white dwarf characterization and spectral modeling. Fitting UV, optical, and near infrared spectra and photometry of white dwarfs. White dwarf population studies using Gaia. Development of machine learning algorithm for white dwarf spectra classification.

Postdoctoral research Assistant **November, 2015 - July, 2016**
University of Warwick, Coventry, UK
Working on identification and characterization of planetary debris around white dwarfs. Exploitation of new large area surveys (VST ATLAS, PTF, PanSTARRS) in various areas of white dwarf science.

PhD Student **October, 2011 - September, 2015**
University of Warwick, Coventry, UK
Development of colour and proper motion based algorithm for selecting high-confidence white dwarf candidates. Large area surveys (e.g. SDSS, LAMOST) data mining for: identification of metal-polluted white dwarfs and multi-epoch photometry variability studies.

Support astronomer at Isaac Newton Telescope **September 2013, - September, 2014**
Isaac Newton Group studentship, Santa Cruz de La Palma, Spain

Duties involved instrument calibration and maintenance, supervising and instructing visiting astronomers, performing service mode and technical nights observations. Additional ING projects related to improving instrument and software user interface.

Observing programs
PI of two successful HST programs: 26 total awarded orbits
PI of multiple successful VLT programs: total of 9 nights
PI of multiple PATT proposals awarded a total of 27 nights Co-I in proposals awarded over 100 nights at 10m to 2m class telescopes

Observing experience
Over 100 nights of experience as observer and support astronomer at the international observatories of Roque de Los Muchachos (La Palma) and Paranal (Chile) for various types of programs (e.g. optical imaging, slit spectroscopy, high-cadence time-resolved photometry).

Member of the WEAVE and 4MOST consortia, and collaborator in DESI and SDSS V
I am involved in the selection of white dwarfs as flux calibrators in WEAVE and DESI and I lead the development of the white dwarf pipeline for 4MOST and SDSS V.

Contributed talks

Congresso Nazionale Oggetti Compatti XI, Firenze, Italy	**November, 2019**
IAU Symposium: White Dwarfs as Probes of Fundamental Physics and Tracers of Planetary, Stellar, and Galactic Evolution; Hilo, USA	**October, 2019**
Royal Astronomical Society specialist meeting, London, UK	**October 2018**
ESO Workshop: A Revolution in Stellar Physics with Gaia and Large Surveys, Warsaw, Poland	**September, 2018**
21th European White Dwarf Workshop, Austin,USA	**July, 2018**
EWASS 2018, Liverpool, UK	**April 2018**
Congresso Nazionale Oggetti Compatti X, Padova, Italy	**December, 2017**
Gaia data workshop, Heidelberg, Germany	**November, 2016**
20th European White Dwarf Workshop, University of Warwick, UK	**August, 2016**
19th European White Dwarf Workshop, Montreal, Canada	**August, 2014**
National Atronomy Meeting, St Andrews, UK	**July, 2013**
18th European White Dwarf Workshop, Krakow, Poland	**August, 2012**

Invited talks

Seminar at Boston University astronomy group, USA	**July, 2021**
Summer workshop on white dwarfs and related objects, University of Warwick, UK	**July, 2021**
KITP online conference: White Dwarfs from Physics to Astrophysics	**March, 2021**
Seminar at OA Trieste	**June, 2020**

Invited collaboration visits

Universidad Técnica Federico Santa Maria, Valparaiso, Chile	**May, 2016**
Space Telescope Science Institute, Baltimore, USA	**November, 2017**

Teaching and student supervision

ESO 3rd summer research programme- student supervision **July - August 2021**
Supervised a master-level student over a six-weeks programme on the characterization of variability in white dwarfs using Gaia DR2. The resulting work was included in Gentile Fusillo et al. (2021

MNRAS, 508, 3877), the student Alina Vorontseva co-authored the paper.

ESO 2nd summer research programme- student supervision **June - August, 2020**
Supervised a master-level student over a six-weeks programme on the topic of stellar variability in Gaia DR2.

Master student co-supervision **January - July, 2016**
Six month co-supervision of master student working on identification of white dwarf triple systems.

Laboratory Demonstrator **October, 2011 - 2013**
Duties included demonstrating undergraduate students through experiments in the teaching labs, marking their work and instructing other demonstrators on the details of the experiments.

Additional academic activities

Co-organizer of the 3rd and 4th ESO summer research programme **2020-2022**
Supervising the candidate selection process, multiple logistic and scientific aspects in the organization of the six-week summer programme. The 3rd edition in 2021 attracted over 140 applicants from 54 countries.

Member of ELT standard stars working group **2021 - ongoing**
Currently leading the selection and characterization of flux standards for the first generation near-IR ELT instruments.

Mentorship support for one PhD student at ESO **2019 - ongoing**

Astronomy group seminar organizer **2015 - 2019**
I organized weekly seminars for the astronomy group at the university of Warwick. Speakers from other institutions were invited to give a one hour talk followed by an informal coffe-break discussion.

Member of the Local Organizing Committee for the 20th European White Dwarf workshop

Scientific Assistants for different panels during the ESO Observing Programmes Committee Panel meetings

Professional service as peer reviewer for ApJ and MNRAS and for PATT telescope-time allocation committees.

Outreach

Regular organizer and speaker of yearly outreach programs in junior-high and elementary schools in Italy since 2016.

Speaker at AstroZoom Public Introductory Astronomy Webinar Series **November, 2020**

Speaker at the EuroScience Open Forum (ESOF 2020) Trieste. **September, 2020**

Computer Skills

- Languages: Python, Unix shell scripts, SQL querying.
- Specific data reduction: Slit spectroscopy using the starlink packages molly and PAMELA. X-shooter data reduction using REFLEX reduction tools and molecfit.

First author publications

- Gentile Fusillo, N. P. et al. (2021 MNRAS, 508, 3877) *A catalogue of white dwarfs in Gaia EDR3*
- Gentile Fusillo, N. P. et al. (2021 MNRAS, 504, 2707) *White dwarfs with planetary remnants in the era of Gaia I: six emission line systems*
- Gentile Fusillo, N. P. et al. (2020 MNRAS, 491, 3613) *Cool white dwarfs as standards for infrared observations*

- Gentile Fusillo, N. P. et al. (2019 MNRAS, 482, 4570) *A Gaia Data Release 2 catalogue of white dwarfs and a comparison with SDSS*
- Gentile Fusillo, N. P. et al. (2017 MNRAS, 473, 3693) *Can magnetic fields suppress convection in the atmosphere of cool white dwarfs? A case study on WD2105-820*
- Gentile Fusillo, N. P. et al. (2017 MNRAS, 469,621) *A catalogue of white dwarf candidates in VST ATLAS*
- Gentile Fusillo, N. P. et al. (2017 MNRAS, 468,971) *Trace hydrogen in helium atmosphere white dwarfs as a possible signature of water accretion*
- Gentile Fusillo, N. P. et al. (2016 MNRAS, 455,2295) *A search for variable white dwarfs in large area surveys: a pilot study in SDSS Stripe 82*
- Gentile Fusillo, N. P. et al. (2015 MNRAS, 452, 765G) *An independent test of the photometric selection of white dwarf candidates using LAMOST DR3*
- Gentile Fusillo, N. P. et al. (2015 MNRAS, 448, 2260G) *A photometric selection of white dwarf candidates in Sloan Digital Sky Survey Data Release 10*

Co-authored publications

- Manser C.J. et al. (2021 MNRAS, tmp.2675M) *Velocity-imaging the rapidly precessing planetary disc around the white dwarf HE 1349-2305 using Doppler tomography*
- López-Sanjuan, C. et al. (2021, arXiv:2110.14421, accepted for publication is A&A) *J-PLUS: White dwarf spectral evolution by PDF analysis*
- van den Ancker M. E. et al. (2021 A& A, 651, 11) *First detection of a disk free of volatile elements around a young A-type star: A possible sign of collisions between rocky planets*
- Hollands M. A. et al. (2021 NatAs, 5, 451) *Alkali metals in white dwarf atmospheres as tracers of ancient planetary crusts*
- Gänsicke B. T. et al. (2020 MNRAS, 499, 2564) *Single magnetic white dwarfs with Balmer emission lines: a small class with consistent physical characteristics as possible signposts for close-in planetary companions*
- McCleery J. et al. (2020 MNRAS, 499, 1890) *Gaia white dwarfs within 40 pc II: the volume-limited Northern hemisphere sample*
- Dennihy E. et al. (2020 ApJ, 905, 5) *Five New Post-main-sequence Debris Disks with Gaseous Emission*
- Hoskin M. J. et al. (2020 MNRAS, 499, 171) *White dwarf pollution by hydrated planetary remnants: hydrogen and metals in WD J204713.76-125908.9*
- Tremblay P.-E. et al. (2020 MNRAS, 497, 130) *Gaia white dwarfs within 40 pc - I. Spectroscopic observations of new candidates*
- Green M. J. et al. (2020 MNRAS, 496, 1243) *Spectroscopic and photometric periods of six ultracompact accreting binaries*
- Moguio M. et al. (2020 A&A, 638, 18) *IGAPS: the merged IPHAS and UVEX optical surveys of the northern Galactic plane*
- Pala A. F. et al. (2020 MNRAS, 494, 3799) *A Volume-limited Sample of Cataclysmic Variables from Gaia DR2: Space Density and Population Propertie*
- Manser C. J. et al. (2020 MNRAS, 493, 2127) *The frequency of gaseous debris discs around white dwarfs*
- Hollands M. A. et al. (2020 NatAs, 4, 663) *An ultra-massive white dwarf with a mixed hydrogen-carbon atmosphere as a likely merger remnant*
- Cunningham T. et al. (2020 MNRAS, 493, 3540) *From hydrogen to helium: the spectral evolution of white dwarfs as evidence for convective mixing*
- Dennihy E. et al. (2020 ApJ, 891, 97) *A Word to the WISE: Confusion is Unavoidable for WISE-selected Infrared Excesses*
- Gänsicke B. T. et al. (2019 Nature, 576, 61) *Accretion of a giant planet onto a white dwarf star*

- Burdge K. B. et al. (2019 Apj, 886, 12) *Orbital Decay in a 20 Minute Orbital Period Detached Binary with a Hydrogen-poor Low-mass White Dwarf*
- Raddi R. et al. (2019 MNRAS, 489, 1489) *Partly burnt runaway stellar remnants from peculiar thermonuclear supernovae*
- Manser C. J. et al. (2019 Sci, 364, 66) *A planetesimal orbiting within the debris disc around a white dwarf star*
- Perpinya-Valles M. et al. (2019 MNRAS, 483, 901) *Discovery of the first resolved triple white dwarf*
- Tremblay P.-E. et al. (2019 MNRAS, 482, 5222) *Fundamental parameter accuracy of DA and DB white dwarfs in Gaia Data Release 2*
- Tremblay P.-E. et al. (2019 Nature, 565, 202) *Core crystallization and pile-up in the cooling sequence of evolving white dwarfs*
- Geier S. et al. (2019 A&A, 621, 38) *The population of hot subdwarf stars studied with Gaia. II. The Gaia DR2 catalogue of hot subluminous stars*
- Hollands, M. A. et al. (2018 MNRAS, 480, 3942) *The Gaia 20 pc white dwarf sample*
- Raddi R. et al. (2018 MNRAS, 470, 96) *Anatomy of the hyper-runaway star LP 40-365 with Gaia*
- Green M. J. et al. (2018 MNRAS, 477, 5646) *A 15.7-minAM CVn binary discovered in K2*
- Raddi R. et al. (2018 ApJ, 858,3) *Further Insight on the Hypervelocity White Dwarf, LP 40-365 (GD 492): A Nearby Emissary from a Single-degenerate Type Ia Supernova*
- Vaduvescu O. et al. (2018 A&A, 609, 105) *280 one-opposition near-Earth asteroids recovered by the EURONEAR with the Isaac Newton Telescope*
- Geier S. et al. (2017 OAst, 26, 164) *Meet the family - the catalog of known hot subdwarf stars*
- Raddi R. et al. (2017 MNRAS, 472, 4173) *Multiband photometry and spectroscopy of an all-sky sample of bright white dwarfs*
- Hermes J. J. et al. (2017 ApJS, 232, 23) *White Dwarf Rotation as a Function of Mass and a Dichotomy of Mode Line Widths: Kepler Observations of 27 Pulsating DA White Dwarfs through K2 Campaign 8*
- Breedt E. et al. (2017 MNRAS, 468, 2910) *Using large spectroscopic surveys to test the double degenerate model for Type Ia supernovae*
- Hermes J. J. et al. (2017 MNRAS, 468, 1946) *When flux standards go wild: white dwarfs in the age of Kepler*
- Geier S. et al. (2017 A&A, 600, 50) *The population of hot subdwarf stars studied with Gaia. I. The catalog of known hot subdwarf stars*
- Tremblay P.-E. et al. (2017 MNRAS, 465, 2849) *The Gaia DR1 mass-radius relation for white dwarfs*
- Bell K. J. et al. (2016 ApJ, 829, 82) *Outbursts in Two New Cool Pulsating DA White Dwarfs*
- Tremblay P.-E. et al. (2016 MNRAS, 461, 2100) *The field white dwarf mass distribution*
- Reindl N. et al. (2014 A&A, 572, 117) *Analysis of cool DO-type white dwarfs from the Sloan Digital Sky Survey data release 10*
- Barentsen G. et al. (2014 MNRAS, 444, 3230) *The second data release of the INT Photometric Hα Survey of the Northern Galactic Plane (IPHAS DR2)*
- Carter P. J. et al. (2014 MNRAS, 439, 2848) *Two new AM Canum Venaticorum binaries from the Sloan Digital Sky Survey III*

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