

Curriculum vitae et studiorum

Curriculum Vitae

NAME AND SURNAME: Marco Erculiani

BIRTH DATE: 19 November 1981

PLACE OF BIRTH: Brescia (Bs)

NATIONALITY: Italian

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LINKEDIN PROFILE: <https://it.linkedin.com/pub/marco-sergio-erculiani/84/849/292>

RESEARCHGATE PROFILE: https://www.researchgate.net/profile/Marco_Sergio_Erculiani

AFFILIATION: CNR-IFN of Padova

INAF - Osservatorio Astronomico di Padova,

Vicolo Osservatorio 5, I-35122 Padova, Italy.

Academic milestones

2000 **Liceo Scientifico Statale Niccolò Copernico, Brescia, Italia**

Scientific high school diploma : 72/100.

May 2000 **London Trinity College**

English language exam. Trinity level: 9, Intermediate category: 78/100

2011 **University of, Padua, Italy**

Master's degree in Astronomy

Mean: 25.6/30

Final exam: 102/110.

Title of the thesis: An interferometer for adaptive optics control

Thesis argument: Feasibility study of an interferometer for the real-time diagnostics of the shape of a deformable mirror for adaptive optics

Thesis argument: Comparative study of the available interferometric systems to monitor a deformable mirror in real time for wavefront sensing and adaptive optics.

2012-2016 **Astronomical Observatory of Padua, Italy**

CISAS-Centre of Studies and Activities for Space "Giuseppe Colombo"

PhD-student

Supervisor: Prof. Riccardo Claudi

Thesis argument: Prevision and analysis of gaseous emissions from photosynthetic bacteria living in a self developed environmental chamber that mimic both atmospheric and radiation conditions of an earth-like planet orbiting around the habitable zone of an M type star. Study of exoplanetary atmospheres and biomarkers detection. Realization of a dynamic LED starlight simulator capable of reproducing the radiation of different stellar types.

PhD thesis argument: Realization and construction of a multi-channel LED radiation source capable to reproduce almost all commercial and stellar sources in the range 365 nm-940 nm. This source has been used in order to reproduce the radiation of different stellar types impacting on the soil of earth-like exoplanets. The aim of the experiment is the study of gaseous emissions of photosynthetic bacteria forced to live in different environmental conditions. For this purpose I have developed a climatic chamber capable to reproduce the environmental conditions of different planets like Earth orbiting around different stars. This set-up helped me to understand if it is possible to detect gaseous bio-signatures from the study of exoplanetary atmospheres. Thanks to this PhD pathway I developed some skills such as photosynthetic pigments spectroscopy techniques, vacuum pumps and pressure measurement skills, LED devices development and realization and mechanical design

with Solidworks. I developed even project management skills as team coordinator, interacting both with industry and University, and administrative expertise purchasing material for my research and devices. Moreover I developed abilities in numerical simulations and data handling with Exelis IDL language.

Formation courses

STEPS Seminars Towards Enterprise for PhD Students – 2013

modules: Instruments and methods, Development and career, Knowledge and values

Period: 16,20,23 September 2013, 21,25,28 October 2013, 15,18,22 November 2013

Certificate released by : Confindustria Padova

Articles published on journals

1. "Simulating Super Earth atmospheres in the laboratory"

R. Claudi, M. S. Erculiani, G. Galletta, D. Billi, E. Pace, D. Schierano, E. Giro and M. D'Alessandro, International Journal of Astrobiology. 05/2015; DOI: 10.1017/S1473550415000117

2. "Eridania Basin: an ancient paleolake floor as the next landing site for the Mars 2020 rover", Maurizio Pajola, Sandro Rossato, John Carter, Emanuele Baratti, Riccardo Pozzobon, Marco Sergio Erculiani, and Marcello Coradini, Icarus 275 (2016) 163–182

3. "Atmospheres in a test tube: state of the art at the Astronomical Observatory of Padova", Marco Sergio Erculiani, R. Claudi, L. Coccola, E. Giro, N. La Rocca, T. Morosinotto, L. Poletto, D. Billi D. Barbisan, M. Bonato, M. D'Alessandro, G. Galletta, M. Meneghini, N. Trivellin, E. Pace M. Cestelli Guidi, D. Schierano, G. Micela, XII Congresso Nazionale di Scienze Planetarie, Bormio, Italy; 02/2015, Memorie della Società Astronomica Italiana, v.87, p.104 (2016)

4. "Atmosphere in a Test Tube",

R. Claudi, E. Pace, A. Ciaravella, G. Micela, G. Piccioni, D. Billi, M. Cestelli Guidi, L. Coccola, M. S. Erculiani, M. Fedel, G. Galletta, E. Giro, N. La Rocca, T. Morosinotto, L. Poletto, D. Schierano, and S. Stefani, XII Congresso Nazionale di Scienze Planetarie, Bormio, Italy; 02/2015, Memorie della Società Astronomica Italiana, v.87, p.112 (2016)

Articles published as conference proceedings

1. "Interpreting EChO's future data: biological laboratory estimates under M star's planetary surface conditions", Erculiani, Marco S.; Claudi, Riccardo U.; Giro, Enrico; Galletta, Giuseppe; D'Alessandro, Maurizio; Farisato, Giancarlo; Lessio, Luigi; Micela, Giuseppina; Billi, Daniela, Proceedings of the SPIE, Volume 9143, id. 914355 12 pp. (2014)

2. "Preparing EChO space mission: laboratory simulation of planetary atmospheres "

Riccardo U. Claudi, Marco S. Erculiani, Giuseppina Micela, Maurizio D'Alessandro, Giuseppe Galletta, Enrico Giro, Alberto Adriani, Francesca Altieri, Giancarlo Bellucci, Daniela Billi, [...], Gabriella Gilli, Marco Giuranna, Davide Grassi, Giuseppe Leto, Emanuele Pace, Maria E. Palumbo, Giuseppe Piccioni, Salvatore Scuderi, Giovanni Strazzulla, Diego Turrini, Proceedings of the SPIE, Volume 9143, id. 91432U 11 pp. (2014)

3. "A tunable integrated system to simulate colder stellar radiation"

Marco S. Erculiani ; Riccardo Claudi ; Diego Barbisan ; Enrico Giro ; Matteo Bonato ; Lorenzo Coccola ; Giancarlo Farisato ; Matteo Meneghini ; Luca Poletto ; Bernardo Salasnich ; Nicola Trivellin, Proc. SPIE 9626, Optical Systems Design 2015: Optical Design and Engineering VI, 96262D (September 23, 2015); doi:10.1117/12.2189053

4. "Adaptive multi-wavelength LED star simulator for space life studies",

Nicola Trivellin, Diego Barbisan, Marco Ferretti, Matteo Dal Lago, Matteo Meneghini, Marco S. Erculiani, Riccardo U. Claudi, Enrico Giro, Matteo Bonato, Lorenzo Coccola, Luca Poletto, Bernardo Salasnich,

Gaudenzio Meneghesso, Enrico Zanoni, DOI: 10.1117/12.2212608 Conference: Light-Emitting Diodes: Materials, Devices, and Applications for Solid State Lighting XX conference, At San Francisco, California, United States, Volume: 9768, 2016

5. Interview from the article: "Troveremo tracce di vita aliena entro 10 anni" by Filippo Bonaventura, Coelum Astronomia n°197, 02/2016, <http://www.joomag.com/magazine/coelum-astronomia-197-2016/0509516001452677461>

Articles waiting for publication

1. "SEARCHING FOR LIFE FINGERPRINTS IN THE LABORATORY", Marco Sergio Erculiani, Riccardo Claudi, Diego Barbisan, Lorenzo Cocola, Nicoletta LaRocca, Nicola Trivellin, Tomas Morosinotto, Luca Poletto, Matteo Meneghini, Bernardo Salasnich, 1st symposium on space educational activities, to be published on ESA SP.

Poster, abstract and reports

1. "ATMOSPHERES IN A TEST TUBE", R. Claudi, M.S. Erculiani, E. Giro, M. D'alessandro, G. Galletta, D. Billi, E. Pace, G. Piccioni, A. Ciaravella: EPSC 2013, London

2. "ATMOSPHERE IN A TEST TUBE", R. Claudi, M.S. Erculiani ARIEL ITALIAN SCIENCE GROUP MEETING, PALERMO, 2013,

3. "SEARCH FOR SPECTRAL FEATURES IN TRANSITING PLANETS WITH THE GAPS PROJECT", Claudi, S. Benatti, M. Bonavita, M.S. Erculiani, A. Garrido Rubio, E. Corvino, A. Maggio, E. Poretti, G. Micela, R. Gratton, I. Pagano & the GAPS board, 'Search for life beyond the Solar System - Exoplanets, Biosignatures & Instruments', Tucson, 2014, R.

4. "Laboratory investigation on super-Earths atmospheres", Erculiani, M. S.; Claudi, R. U.; Lessio, L.; Farisato, G.; Giro, E.; Cocola, L.; Billi, D.; D'alessandro, M.; Pace, E.; Schierano, D.; Benatti, S.; Bonavita, M.; Galletta, G., European Planetary Science Congress 2014, EPSC Abstracts, Vol. 9, id. EPSC2014-691

5. "Biosignature Characterization: from Lab to Space", Debora Schierano, Mickael Baqué, Daniela Billi, Emanuele Pace, Mariangela Cestelli Guidi, Riccardo Claudi, Cyrien Verseux, Marco Sergio Erculiani, 40th COSPAR Scientific Assembly, Moscow, Russia; 08/2014

6. "ATMOSPHERE IN A TEST TUBE", R Claudi, E Pace, A Ciaravella, G Micela, G Piccioni, D Billi, M Cestelli Guidi, L Cocola, M. S. Erculiani, M Fedel, G Galletta, E Giro, N La Rocca, T Morosinotto, L. Poletto, D Schierano, S Stefani, , The Astrobiology Science Conference 2015 (AbSciCon2015), Chicago, Illinois; 06/2015

7. "Atmosphere in a test tube", Riccardo Claudi, Emanuele Pace, Marco Sergio Erculiani, Angela Ciaravella, Giuseppe Galletta, Nicoletta LaRocca, Giusi Micela, Thomas Morosinotto, Giuseppe Piccioni, Daniela Billi, Pathways 2015: Pathways Towards Habitable Planets, Bern; 07/2015

8. "Exoplanets atmosphere in a test tube", G. Galletta, R. Claudi, E. Pace, A. Ciaravella, G. Micela, G. Piccioni, D. Billi, M. Cestelli Guidi, L. Cocola, M.S. Erculiani, M. Fedel, E. Giro, N. La Rocca, T. Morosinotto, L. Poletto, D. Schierano, S. Stefani, 5th Workshop of the Italian Astrobiology Society, Life in a Cosmic Context

9. "Microorganisms suitable for studying biomarkers within the atmosphere in a test tube project",

G. Galletta, R. Claudi, E. Pace, A. Ciaravella, G. Micela, G. Piccioni, D. Billi, M. Cestelli Guidi, L. Cocola, M.S. Erculiani, M. Fedel, E. Giro, N. La Rocca, T. Morosinotto, L. Poletto, D. Schierano, S. Stefani
5th Workshop of the Italian Astrobiology Society, Life in a Cosmic Context

10. "Photosynthesis on extrasolar planets: state of art and preliminary results of a pioneering experiment."
Caterina Pozzer, Riccardo Claudi, Anna Segalla, Diana Simionato, Sergio Erculiani, Lorenzo Coccola,
Bernardo Salasnich, Luca Poletto, Daniela Billi, Tomas Morosinotto, Nicoletta La Rocca, FISV 2016
XIV Congress, Roma, 20-23 September, 2016

11. "Atmosphere in a Test Tube: habitability in Laboratory", R. Claudi, N. La Rocca, A.C. Pozzer, B.
Salasnich, D. Billi, A. Ciaravella, L. Cocola, M. S. Erculiani, G. Micela, T. Morosinotto, E. Pace, L. Poletto,
ECLA 2016,
Madrid, Spagna, 21-25 November, 2016

12. "Minor Planet Observations", Foglia, S.; Cremaschini, C.; Marinello, W.; Micheli, M.; Pizzetti, G.;
Zani, T.; Soffiantini, A.; Erculiani, M., Minor Planet Circular 51502, 4 (2004)

Professional experiences

September 2016-now: Research fellow at CNR-IFN of Padova

January 2016-August 2016: Mathematics and Physics teacher at Liceo Artistico A. Modigliani, Padova

2012-2016: Astronomical Observatory of Padua, Italy

CISAS-Centre of Studies and Activities for Space "Giuseppe Colombo"

PhD-student

Supervisor: Prof. Riccardo Claudi

Thesis argument: Prevision and analysis of gaseous emissions from photosynthetic bacteria
living in a self developed environmental chamber that mimic both
atmospheric and radiation conditions of an earth-like planet orbiting around
the habitable zone of an M type star. Study of exoplanetary atmospheres
and biomarkers detection. Realization of a dynamic LED starlight simulator
capable of reproducing the radiation of different stellar types.

Outreach experiences

5 December 2013 : Unione Astrofili Bresciani, Brescia: Exoplanet characterization and life in the universe
conference

March 2013: LNF Frascati laboratories for the "Atmosphere in a test tube" project

2009-2013: Math, Physics and Astronomy private tutor

July 2007 : Gruppo Astrofili M. Hack, Sottomarina (VE): Galactic morphology and
dynamics conference

June 2006 : Unione Astrofili Bresciani, Brescia: Active and adaptive optics
conference

September 2005: Unione Astrofili Bresciani, Brescia: Galaxy structure and evolution
conference

29 July 2005 - 31 July 2005: Serafino Zani Observatory, Lumezzane (BS): Conferences and stage
on telescope utilization, digital images acquisition and elaboration
techniques

December 2003- December 2004: Astronomical Observatory of Padua: Museum guide

Memberships

MENSA Italiame mbership QI-156 (Scala Cattell) since October, 2013

Languages

ITALIAN: Mother language

	Reading	Speaking	Writing
English	Very good	Very good	Very good
Portoguese	Basic	Basic	Basic
Spanish	Good	Basic	Basic
French	Good	Basic	Basic

Computer skills

Operative systems: Windows, Mac OS X, Linux.

Software: Microsoft Word, Excel, Powerpoint, AVS Video Editor, Adobe Photoshop, Inkscape , Latex, IDL, IRAF, SolidWorks, OceanView, SpectraSuite

Other skills

Optical bench utilization, He-Ne Lasers, Interferometers, photosynthetic pigments spectroscopy, void pumps and pressure measurements, LED devices simulations and projects, spectroscopy, project managements, industry interaction and purchase management, numerical simulations.

I developed a very good attitude in solving problems, brain storming and managing a working team, as well as interacting and motivating all of the components in order to follow a common objective.

Moreover i developed a good business instinct.

I authorize my personal data treatment under the law D.Lgs. 196/2003

Padova, 28/04/2016

Marco Erculiani