

Dr. Johanna Chantzou

Dr. Johanna Chantzou
Scientific Consultant and Entrepreneur
Citizenships: Greek / German
Email: contact@heronspecs.com
Websites: johannachantzou.com — heronspecs.com



Education

- 2020 Ph.D. in Physics (**summa cum laude**)
Max-Planck-Institute for extraterrestrial Physics, Garching, Germany
- 2016 M.Sc. in Physics
University of Kassel, Germany
- 2013 B.Sc. in Physics
University of Kassel, Germany
- 2009 Highschool
First General Lyceum of Kos, Greece

Professional work

Freelance Scientific Consultant and Founder of HeronSpecs

October 2025 – present

Self-employed / HeronSpecs

- Providing scientific consulting, analytical services and project management services to research teams and high-tech firms working with scientific instrumentation.
- Founder of HeronSpecs, an online platform offering digital toolkits and templates that support project and lab management.
- Managing the full cycle of digital product development, branding, and marketing, with focus on clarity, accessibility, and design for scientific professionals.
- Combining academic expertise with entrepreneurial skills to deliver both tailored services and scalable digital solutions for applied science and technology organizations.

Project Manager and Product owner for cryogenic and microscope systems
attocube systems AG

August 2021 – October 2025

- Project manager of customer projects—both standard or highly customized—involving a range of attocube products, such as cryostats, optical microscopes, nanopositioners and superconducting magnets. This role involves
 - Planning customer projects
 - Technical design and development of customized systems in cooperation with the mechanical design team and the R&D.
 - Supervision and coordination of the production, testing, shipping and installation of the systems
 - Tracking project performance (material costs and time schedule)

- Customer communication
- Drafting debriefing reports and/or holding debriefing meetings
- Product owner for a series of products including vacuum shrouds, cold shields and cryogenic parts that are heavily used in the field of Quantum Optics. This role involves
 - Technical expertise and responsibility for maintaining and ensuring the products' performance
 - Serialization of respective products, thus improving their production efficiency and fulfilling customer expectations
 - Optimization of processes that target product standardization, product care and product management.

Patent Attorney Trainee

October 2020 – May 2021

Stellbrink & Partner Patentanwälte mbB

- Close cooperation with inventors from various scientific and technical fields (electron microscopy, spectroscopy and image processing of aerial photographs)
- Drafting patent applications, conducting patent searches and consulting on the disclosure and evaluation of inventions

Research

Postdoc and PhD Student

October 2016 – March 2020

Max-Planck-Institute for extraterrestrial Physics

Director: Prof. Dr. Paola Caselli

- PhD thesis: “*High resolution spectroscopy of molecules of astrophysical interest and radio astronomical observations of star forming regions*”. Overall score: **summa cum laude**
- Millimeter and submillimeter rotational spectroscopy of reactive molecules in the gas phase
- Design and characterization of a supersonic jet spectrometer for the production and spectroscopic investigation of reactive molecules by means of electrical gas discharge and adiabatic expansion of a molecular beam within high-vacuum conditions
- Procurement, technical implementation and characterization of mechanical, electrical and optical components:
 - Bolometer and Shottky diodes for signal detection
 - Frequency generator, waveguide amplifier, multiplier and lock-in amplifier for signal generation and signal processing
 - Horn antennas, waveguides and Teflon/HDPE lenses for the transmission, collimation and reception of microwave/mm/THz radiation
 - Mass spectrometer to analyze the chemical composition of the molecular beam
 - High-vacuum and cryogenic components
- Planning, organization and execution of spectroscopic measurements
- Modeling of spectral lines to determine the spectroscopic molecular parameters and extension of line catalogs with highly precise frequencies
- Computer programming of scripts for the analysis of laboratory and astronomical data
- Astronomical observations of molecular spectral lines within star formation regions in the millimeter and microwave range with the following telescopes:
 - Millimeter-Telescope IRAM 30m in Granada, Spain

- Radiotelescope Green Bank in West Virginia, U.S.A
- Radiotelescope Effelsberg in Bad Münstereifel-Effelsberg, Germany.
- Theoretical models for the simulation of interstellar chemical processes within the early phases of star formation
- Publication of scientific results in renowned journals (*Astronomy & Astrophysics*, *The Astrophysical Journal*)

M. Sc. und B. Sc. Student
 University of Kassel

October 2009 – August 2016
 Supervisor: Prof. Dr. Thomas Giesen

- Master thesis: “*Construction and characterization of a chirped-pulse microwave spectrometer*”.
 - Generation of chirp frequency pulses through the use of an arbitrary generator
 - Characterization and implementation of horn antennas, amplifiers, frequency mixers and multipliers in the K-, Ka- and W-band
- Bachelor thesis: “*Optical spectroscopy of astrophysically relevant molecules in a supersonic jet*”.
 - Generation of molecular carbon chains by means of laser ablation of metal rods
 - Implementation of solid-state lasers (Nd:YAG laser), glass fiber technology and CCD detectors
- Several courses and lectures in the field of solid-state physics, semiconductor lasers and optoelectronics (Prof. Dr. Hartmut Hillmer)
- Student assistant for the supervision and training of undergraduate students within the internship “*Microwave spectroscopy of maser transitions of ammonia*” as well as for the development and realization of the above mentioned experiment
- Spectroscopic measurements of atmospheric trace gases with an FTIR spectrometer (Bruker)

Skills and further qualifications

- Applied Physics
- High-resolution molecular spectroscopy (in the microwave-/millimeter-, as well as in the UV- and optical frequency range)
- Practical laboratory experience with mm/THz electronics and optics, semiconductor amplifiers/detectors, laser technology, high-vacuum technology, etc.
- Practical experience with nanotechnology applications (e.g. nanopositioners) and cryogenic microscopy
- Hands-on experience with the mechanical design of several spectroscopic experiments
- Experience with drafting patent applications, doing prior art search and client consultation
- Project management (with a certified, completed workshop)
- Product ownership
- Product care and standardization
- Product engineering and development
- Customer communication
- Document production: LATEX, Microsoft Office, Open Office
- Data analysis/visualization: Matplotlib, Origin, Excel and Gnuplot

- Programming language: Python
- Operating systems: Microsoft Windows, macOS 10
- Language skills: German, Greek (as mother tongues) and English (fluent in spoken and written)
- Analytical thinking

Training and workshop experience

Project Management Workshop
attocube systems AG

May 2022

Organizer: attocube systems AG

- Interactive workshop for learning the basic concepts, methods and strategies that are essential for successful project management

The International Max Planck Research School on Astrophysics (IMPRS)
Max-Planck-Institute for extraterrestrial Physics

October 2016 – March 2020

Supervisor: Prof. Dr. Paola Caselli

- Completion of the introductory course in astrophysics at the Ludwig-Maximilian-University followed by a written exam.
Overall score: (A)
- Completion of the following advanced courses in astrophysics:
 - *Galaxy Evolution from the Galaxies' Perspective: from interstellar gas, to stars, to black holes and back*, Prof. Dr. R. Genzel, April 2019.
 - *Astrophysics on Black Holes*, Dr. A. Merloni, February 2019.
 - *High Resolution Imaging Methods in Astronomy*, Prof. Dr. A. Glindemann, January 2019.
 - *The Homogeneous Universe and Large Scale Structure*, Prof. Dr. H. Böhringer, July 2018.
 - *Astrochemistry and Star/Planet Formation*, Prof. Dr. P. Caselli, November 2017.
 - *High Energy Processes and Objects*, Prof. Dr. M. Gilfanov, October 2017.
- Scientific presentations in the context of the IMPRS Symposia:
 - “*The $c\text{-C}_3\text{HD}/c\text{-C}_3\text{H}_2$ ratio in low-mass star forming regions*”, IMPRS Symposium, 26. October 2017.
 - “*Development and Implementation of the CAS supersonic jet experiment*”, IMPRS Symposium, 05. April 2019.

10th IRAM millimeter interferometry school
Institut de Radioastronomie Millimetrique

October 2018

Organizer: IRAM

- Interactive block seminar for acquiring the basic concepts of interferometry and reducing and evaluating data from the NOEMA interferometer

Programming course in Python, Bash und Git
Max-Planck-Institute for extraterrestrial Physics

June 2017

Organizer: IMPRS

- Interactive block seminar for learning the Python, Bash and Git programming language

Publications

- J. Chantzos, V. M. Rivilla, A. Vasyunin, E. Redaelli, L. Bizzocchi and P. Caselli “The first steps of Interstellar Phosphorus Chemistry” *A&A* **2020**, 633, A54, DOI: 10.1051/0004-6361/201936531.
- J. Chantzos, S. Spezzano, C. Endres, L. Bizzocchi, V. Lattanzi, J. Laas, and P. Caselli, “Rotational spectroscopy of the HCCO and DCCO radicals in the millimeter and submillimeter range” *A&A* **2019**, 621, A111, DOI:10.1051/0004-6361/201834419.
- J. Chantzos, S. Spezzano, P. Caselli, A. Chacon-Tanarro, L. Bizzocchi, O. Sipilä and B. M. Giuliano, “A study of the $c\text{-C}_3\text{HD}/c\text{-C}_3\text{H}_2$ ratio in low-mass star forming regions” *Astrophys. J.* **2018**, 863, 126, DOI:10.3847/1538-4357/aad2dc.
- V. Lattanzi, S. Spezzano, J. C. Laas, J. Chantzos, L. Bizzocchi, K. L. Kelvin, M. C. McCarthy, and P. Caselli, “HSCO⁺ and DSCO⁺: a multi-technique approach in the laboratory for the spectroscopy of interstellar ions” *A&A* **2018**, 620, A184, DOI:10.1051/0004-6361/201834340.
- G.W. Fuchs, D. Witsch, D. Herberth, M. Kempkes, B. Stanlik, J. Chantzos, H. Linnartz, K. Menten, and T.F. Giesen “Deep search for hydrogen peroxide towards pre- and protostellar objects Testing the pathway of grain surface water formation” *accepted by A&A*, 2019

Scientific Presentations on Conferences and Workshops

- J. Chantzos, S. Spezzano, P. Caselli, A. Chacon-Tanarro, L. Bizzocchi, O. Sipilä and B. M. Giuliano, “A study of the $c\text{-C}_3\text{HD}/c\text{-C}_3\text{H}_2$ ratio in low-mass star forming regions” *The 10th IRAM millimeter interferometry school*, Grenoble, Frankreich, **1.-5. Oktober, 2018**.
- J. Chantzos, S. Spezzano, C. Endres, L. Bizzocchi, V. Lattanzi, J. Laas, A. Vasyunin and P. Caselli, “Accurate sub-millimeter rest-frequencies for HCCO and DCCO radicals” *The 25th International Conference on High Resolution Molecular Spectroscopy*, Bilbao, Spanien, **3.-7. September, 2018**.
- J. Chantzos, S. Spezzano, C. Endres, V. Lattanzi, L. Bizzocchi, B. M. Giuliano, J. Laas, D. Prudenzano, P. Caselli, “Direct Absorption Rotational Spectroscopy at the Center for Astrochemical Studies” *The LabAstro2017 Workshop*, Bonn, Deutschland, **29. November-1. Dezember, 2017**.
- J. Chantzos, S. Spezzano, P. Caselli, A. Chacon-Tanarro, L. Bizzocchi, O. Sipilä and B. M. Giuliano, “A study of the $c\text{-C}_3\text{HD}/c\text{-C}_3\text{H}_2$ ratio in low-mass star forming regions” *The 72nd International Symposium on Molecular Spectroscopy*, Urbana-Champaign, Illinois, **19.-23. Juni, 2017**.
- J. Chantzos, D. Herberth, and T. F. Giesen, “A chirped pulse spectrometer for supersonic jet applications” *DPG Frühjahrstagung*, Heidelberg, Deutschland **23.-27. März, 2015**.

Conference proceedings

- J. Chantzos, S. Spezzano, P. Caselli, A. Chacon-Tanarro, L. Bizzocchi, O. Sipilä and B. M. Giuliano, “A study of the $c\text{-C}_3\text{HD}/c\text{-C}_3\text{H}_2$ ratio in low-mass star forming regions” *Proc. of: The 72nd International Symposium on Molecular Spectroscopy* **2017**, DOI:10.15278/isms.2017.TA05.
- J. Chantzos, D. Herberth, P. Kutzer, C. Muster, G.W. Fuchs and T.F. Giesen, “The Kassel Laboratory Astrophysics THz Spectrometers” *Proc. of: The 71st International Symposium on Molecular Spectroscopy* **2016**, DOI:10.15278/isms.2016.RH01.

Honors

- PhD graduation with honors (summa cum laude)
- Josef-Pliva-Preis for the best talk of a young scientist, “Accurate sub-millimeter rest-frequencies for HCCO and DCCO radicals” *The 25th International Conference on High Resolution Molecular Spectroscopy*, Bilbao, Spanien, **3.-7. September, 2018**.

Last updated: October 7, 2025