

# Resume

## Personal data

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## Education

### **Academic**

**PhD in Physics, with specialization in Geophysics**, Space Research Centre of Polish Academy of Sciences, June 20<sup>th</sup> 2007. Title of thesis: *“Thermal structure of the atmosphere of Mars from selected measurements by the spectrophotometer PFS during the mission Mars-Express”*, Advisor: Prof. Dr. hab. Andrzej Jurewicz

**MSc in Physics, with specialization in Physics of Environment**, Faculty of Physics, University of Warsaw, October 26<sup>th</sup> 2000. Title of thesis: *“The ultraviolet transmittance of the Earth atmosphere for known aerosol abundances”*, Advisors: Prof. Dr hab. Andrzej Jurewicz and Prof. Dr hab. Aleksandra Kopystyńska.

### **Other courses**

Workshop *“QUANTIFY Annual Meeting Activity 6, Radiative Forcing and Climate Change”*, Toulouse, France, 7.02 - 10.02.2006

Workshop *“2<sup>th</sup> International Workshop on Mars Atmosphere Modeling and Observations”*, Granada, Spain, 26.02 – 01.03.2006

## Professional experience

### **1998 – 2000 - Physics of Environment MSc student, Faculty of Physics at Warsaw University**

The purpose of master thesis was to assess the impact of different aerosol optical depths on the UV radiation incident on the layers adjacent to the surface, for the Earth atmosphere case. The work was carried out by means of numerical simulations based on LOWTRAN code.

### **2001 - 2007 - PhD student at the Space Research Centre of Polish Academy of Sciences**

During my PhD study my skills were expanded toward the geophysical and geological fields. I have attended to several lectures during the first three years of PhD course including:

Mathematical Methods of Geophysics

Physics of Atmosphere and Hydrosphere

Physics of Litosphere and Planetology

During my PhD study I participated in the following projects:

*“Thermal structure of the atmosphere of Mars from selected measurements by the spectrophotometer PFS during the mission Mars-Express”* supported by the Polish Ministry of Education and Science under grant 4 T12E 02930 received in 2006 and completed in 2007 as a full-time employee. This grant was fully dedicated to my PhD dissertation.

*“Analysis of the data measured by Planetary Fourier Spectrometer a board the Mars Express spacecraft”* supported by EUROPLANET Personnel Exchange program, granted in 2006 for a one week visit in “Istituto Nazionale di Astrofisica (INAF) Istituto di Fisica dello Spazio Interplanetario (IFSI)” in Rome

*“QUANTIFY- Quantifying the Climate Impact of Global and European Transport Systems, Radiative Forcing and Climate Change”* supported by the 6<sup>th</sup> Framework Programme within Global Change and Ecosystems, as a part-time employee in 2005-2006 at Warsaw University (Institute of Geophysics, Faculty of Physics)

- *“Modelling the spectrometric measurements of the surface and surroundings of Mars (for the experiment PFS within the Mars-Express mission) and of the comet Wirtanen (for the experiment VIRTIS within the Rosseta missions – preparation to the interpretation of experimental results”* supported by the Polish Ministry of Education and Science under grant 5 T12E 002 23, as a part-time employee in 2003 - 2005.

**23.10.2007 – 23.10.2008** – full-time job in Institute of Physics of Interplanetary Space INAF (Istituto Nazionale di Astrofisica), Rome

**23.10.2008 – 23.10.2009** – full-time job in Institute of Physics of Interplanetary Space INAF (Istituto Nazionale di Astrofisica), Rome

**24.10.2009 – 10.01.2010** - full-time job in Institute of Physics of Interplanetary Space INAF (Istituto Nazionale di Astrofisica), Rome

**11.01.2010 – 10.01.2011** – Post doc position at Caltech - JPL

### **Scientific experiences abroad**

2 weeks visit for *“Study of Mars by Planetary Fourier Spectrometer for Mars-Express”* within the international agreement between Consiglio Nazionale delle Ricerche (CNR) and Polish Academy of Sciences (PAS), INAF- IFSI, Rome, Italy, 14.11. – 28.11.2005

1 week visit for *“Analysis of the data measured by Planetary Fourier Spectrometer a board the Mars Express spacecraft”*, INAF - IFSI, Rome, Italy, 6.08. – 13.08.2006;

1 week visit for *“Analysis of the data measured by Planetary Fourier Spectrometer a board the Mars Express spacecraft”* to be completed, INAF - IFSI, Rome, Italy, 5.11. – 12.11.2006

1 week visit dedicated to the preparation of the revised version of the paper *“The impact of Martian aerosols on the retrieval of temperature profiles from PFS measurements”*, INAF - IFSI, Rome, Italy, 2.06. – 9.06.2007

### **Scientific interests**

Thermal structure of Martian atmosphere and related phenomena

Development, coding, validation and usage of inversion algorithms for the retrieval of atmospheric parameters from remote sensed IR data (PFS-Mars Express)

Direct radiative transfer simulations in the atmospheres of terrestrial planet (Earth and Mars), namely, critical comparison of results provided by different RT codes (e.g.: LIDORT and LOWTRAN)

Modelling of impact of pollution by anthropogenic aerosols on the UV and VIS transmittance, radiance and irradiance near the surface (Earth)

Determination of mineralogical composition of planetary surfaces from remote sensing data (Mars)

### **Seminars**

*Conditions of existence of water vapour and ice on Mars* – Space Research Centre, 2002

*Exploration of Mars from previous and present missions* – lectures for Primary and Secondary School, Space Research Centre, 2003

*Application of radar to study of atmosphere*, internal project in Space Research Centre, 2004

*Analysis of Martian spectra performed by Thermal Emission Spectrometer*, Warsaw University, Institute of Geophysics, Faculty of Physics, 2004

*Water ice clouds over Tharsis region*, Space Research Centre, 2005

*The thermal structure of Martian atmosphere*, Space Research Centre, 2006

Several public outreach events in 2003, 2004 and 2006 (Mars)

## **22.01 – 24.01.2008 - PFS meeting, IFSI-INAF**

“*Simultaneous observations of Martian atmosphere by PFS-MEX and Mini-TES-MER*”, presentation  
“*Preliminary study of the global dust storm from PFS measurements*”, presentation

## **Other skills**

### **Computer:**

Common office applications of MS Windows, Linux - basic

Programming languages: Fortran 77, Matlab, IDL

Specific programs for professional purposes: LOWTRAN, LIDORT, MODTRAN, STREAMER.

### **Languages:**

English: intermediate

Italian: basic

## **List of publications**

**Wolkenberg P.**, Jurewicz, A., Błęcka, M.I., “*The retrieval of temperature profiles in the Martian atmosphere in the infrared CO<sub>2</sub> band absorption – comparison results retrieved by two methods*”, internal report of SRC Nr 1/2005, 2005

Zalewska, N., **Wolkenberg, P.**, “*Mineralogical composition of the Martian surface on the basis of infrared spectroscopy*”, Mineralogia Polonica, special papers, 2007.

**Wolkenberg P.**, D. Grassi, V. Formisano, G. Rinaldi, M. D’Amore and M. Smith., “*Simultaneous observations of Martian atmosphere by PFS-MEX and Mini-TES-MER*”, 2009, JGR, vol. 114, E04012, doi:10.1029/2008JE003216.

**Wolkenberg P.**, D. Grassi, V. Formisano, “*The impact of Martian aerosols on the retrieval of temperature profiles from PFS-MEX measurements*”, 2009, JQSRT, 110, 1908-1925.

**Wolkenberg P.**, V. Formisano, G. Rinaldi, A. Geminale, “*The atmospheric temperatures over Olympus Mons on Mars: an atmospheric hot ring*”, 2010, Icarus, 207, 110 – 123.

Myhre, G., M. Kvalevag, G. Rädcl, J. Cook, K. P. Shine, H. Clark, F.Karcher, K. Markowicz, A. Kardas, **P. Wolkenberg**, Y. Balkanski, M. Ponater, P. Forster, A. Rap, R. Rodriguez De Leon et al., 2009, “*Intercomparison of radiative forcing calculations of stratospheric water vapour and contrails*”, Meteorologische Zeitschrift, vol.18, 6, 585-596.

Moehlmann D.T.F., M. Niemand, V. Formisano, H. Savijarvi, **P. Wolkenberg**, „*Fog phenomena on Mars*”, 2009, Planet. and Space Sci., vol. 57, 14-15, 1987-1992.

## **Conference contributions**

“*2<sup>th</sup> International Workshop on Mars Atmosphere Modeling and Observations*”, Granada, Spain, 26.02 – 01.03.2006

D. Grassi, P. Wolkenberg, C. Fiorenza, V. Formisano, N. I. Ignatiev, L.V. Zasova, “*Studies of the local circulation in the Martian atmosphere from PFS data*”

“*4<sup>th</sup> General Assembly of the European Geosciences Union*”, Vienna, Austria, 15.04-18.04.2007

P. Wolkenberg, D. Grassi, V. Formisano, A. Jurewicz, “*The impact of Martian aerosols on the retrieval of temperature profiles from PFS measurements*”, (poster)

XIV Meeting of the Petrology Group of the Mineralogical Society of Poland, Bukowina Tatrzańska, Poland, 18.10. – 21.10.2007

N. Zalewska, P. Wolkenberg, "Mineralogical composition of the Martian surface on the basis of infrared spectroscopy" (poster)

*3<sup>rd</sup> European Planetary Science Congress 2008, 21 – 26 September 2008, Muenster, Germany*

P. Wolkenberg, D. Grassi, V. Formisano, G. Rinaldi, M. D'Amore and M. Smith, "Simultaneous observations of Martian atmosphere by PFS-MEX and Mini-TES-MER", presentation

*"3<sup>rd</sup> International Workshop on Mars Atmosphere Modeling and Observations", Williamsburg, USA, 10.11 – 13.11.2008*

P. Wolkenberg, V. Formisano, T. Michaels, G. Rinaldi, L. Montabone, M. D'Amore, A. Geminale and A. Spiga., "An atmospheric hot ring around Olympus Mons – Comparison with Mesoscale Models (LMD and MRAMS)", presentation