Dr. Nilda Oklay

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Personal information

Date of birth: March, 28^{th}, 1981

Nationality: Turkish

Languages: Turkish (native), English (fluent), German (intermediate)

Hobbies: Photography, scuba diving (CMAS ★), glass etching, reading, music, computer & board games, programming, traveling

Education

2003 **B.Sc. in Astronomy and Space Sciences**, *İstanbul University (İ.Ü.)*, İstanbul, Turkey.

2004 **B.Sc. in Physics (Double Majority)**, *İ.Ü.*, İstanbul, Turkey.

2006 **M.Sc. in Astronomy and Space Sciences**, *İ.Ü.*, İstanbul, Turkey.

2011 **Ph.D. in Astrophysics**, *Georg-August-Universität Göttingen*, International Max Planck research school for solar system and beyond (IMPRS), Göttingen, Germany.

Scientific Experience

2003 **Diploma Thesis**, *İ.Ü.*, İstanbul, Turkey.

Sun-Earth Connections: study of solar related events on Earth.

2006 **Master Thesis**, *İ.Ü.*, İstanbul, Turkey.

General properties of 23^{rd} solar cycle: Investigation of 23^{rd} solar cycle with several solar indices (relative sunspot number, total solar irradiance, total areas of sunspot group, solar 10.7 cm flux, flare index and mean magnetic fields)

2011 **PhD Thesis**, *IMPRS, Georg-August-Universität Göttingen*, Göttingen, Germany, ISBN 978-3-942171-46-5, uni-edition GmbH 2011.

Spectropolarimetric investigations of small scale magnetic structures of solar photosphere (spectropolarimetric observations of various solar photospheric lines and their Stokes profile inversions and forward modeling of the observed spectral lines using atmospheric models obtained from MURaM MHD simulations.)

01/2011-07/2011 **Post-Doc**, *Max Planck Institut für Sonnensystemforschung (MPS)*, Katlenburg-Lindau, Germany, Solar Department.

Nature of micropores of the Solar atmosphere

07/2011-03/2012 **Assistant Scientist in the OSIRIS camera system (on board Rosetta) team**, *MPS*, Katlenburg-Lindau, Germany, Planetary Department.

Hydrocode simulations of impacts on small bodies: Code testing and benchmarking

03/2012-08/2016 **Associate Scientist in the OSIRIS team**, *MPS*, Göttingen, Germany, Planetary Department.

Preparation of OSIRIS multicolor data reduction pipeline, verification of OSIRIS observations using ground reference model

12/2016-Present **Postdoc**, *DLR Institute for Planetary Research*, Berlin, Germany, Comets and asteroids group.

Multi-instrumental analysis of comet 67P using Rosetta mission data.

Observational Experience

29/03/2006 **İstanbul University project no.** 470/27122005, *Coronal white-light, polarization and fine structure observations during 29 March 2006 total solar eclipse*, Manavgat, Turkey.

3-8 June 2007 **Spectropolarimetric observations of some photospheric spectral lines at IRSOL**, *3 active regions are observed simultaneously in Stokes I and Stokes V/I using ZIMPOL II at the solar disk center*, Locarno, Switzerland.

8-25 June 2009 **Ground based observational support to SUNRISE from VTT with TIP II**, *GFPI and 2 broadband cameras and additional observations of micropores on the active regions afterwards*, Tenerife, Spain.

2007-2009 **Teaching assistant duty**, *Observations of various eclipsing binary stars from the 50 cm Cassegrain telescope of Göttingen University Astrophysics Institute*, Göttingen, Germany.

1/10/2013-31/01/2014 **T100 project:2013C-515**, *Observing the fate of sungrazing comet C/2012 S1 (ISON)*, Tubitak National Observatory-Antalya, Turkey, (observations every 4^{th} night).
PI, observer, data analysis

18-20, 29-31 December 2013 **RTT150 project:2013B-480**, *What will happen to the sungrazing comet C/2012 S1 (ISON)?*, Tubitak National Observatory-Antalya, Turkey.
PI, observer, data analysis

Teaching Experience

2003-2006 **Teaching assistant on mathematics, physics and geometry for middle school and high school students**, *İstanbul, Turkey*.

2007-2008 **Teaching assistant on the observations of eclipsing binary stars (Dr. S. Schuh)**, *Georg-August Göttingen University, Germany, SoSe 2007, WiSe 2007/2008, SoSe 2008, WiSe 2008/2009*, during 4 semesters.

2009, 2012 **Teaching assistant on the data analysis lectures: analysis of solar spectra (Prof. Dr. Laurent Gizon)**, *Georg-August Göttingen University, Germany, WiSe 2009-2010, WiSe 2011-2012* , in 2 semesters.

Technical Experience

2012-2016 **Preparation and maintenance of OSIRIS multicolor data reduction pipeline**, *using USGS ISIS3 and IDL.*

2012-2016 **Development of surface mapping pipeline for irregular shapes and maintenance**, *using USGS ISIS3 and ENVI.*

2013-2016 **Responsible of Ground Reference Model of OSIRIS**, *camera system on board Rosetta*, operation of OSIRIS, sequence validation, command testing.

2013-2016 **Clean room experience**, *MPS*, certification for ISO 6 and ISO 8.

2014-Present **Multispectral data support for the OSIRIS team**, *MPS*, providing multispectral analysis and/or generating multispectral cubes for various analysis.

Selected list of scientific projects (Planetary science related only)

2011-Present **Hydrocode simulations of impacts on small bodies**, *using iSALE-Hydrocode, iSALEPlot and vimod.*

2012-Present **Particle-code simulations of granular material on small bodies**, *using ESyS-Particle code and Python.*

2012 **Office-scale impact experiments and numerical simulations**, *using ESyS-Particle code and Python.*

2012-Present **Analysis of OSIRIS color data for surface mineralogy**, *using ISIS3, ENVI and IDL*, applications to Mars, asteroid 21 Lutetia and comet 67P/Churyumov-Gerasimenko.

2012-Present **Characterization of OSIRIS filters for mineralogic information**, *using IDL*, applications to asteroid Lutetia, comet 67P and support to CAESAR mission.

2012-2013 **Fate of impactors on comets**, *buried impactors*, using iSALE-Hydrocode, iSALEPlot and vimod.

2012-2014 **Dark material on Vesta**, *impacts and delivery of the dark material*, using iSALE-3D, and vimod.

2014-Present **Spectral investigation of active regions on comet 67P using multispectral OSIRIS NAC images**, *generation of multispectral NAC data and application of spectral techniques*, using USGS ISIS3, ENVI, IDL.

2014-Present **GAIA-SUN-SSO, The GAIA Follow-Up Network for Solar System Objects**, *imaging and spectroscopic observations at TUG.*

2015-Present **Comet 67P surface mapping**, *map projections of OSIRIS NAC images of comet 67P*, using USGS ISIS3 and ENVI.

2015-Present **AIDA mission, impacts working group**, *hydrocode impact simulations using iSALE2D and iSALE3D.*

2015-Present **OSIRIS-ALICE intercalibration**, *extending spectral ranges of both instruments.*

2015-Present **OSIRIS-VIRTIS intercalibration**, *extending spectral range of OSIRIS and including spatial resolution to VIRTIS observations.*

2015-2016 **Comparison of icy patches on the surface of comets**, *analysis of multispectral imaging data.*

2016-Present **Temporal evolution of long lived water ice deposits observed on comet 67P**, *analysis of multispectral imaging data.*

Computer skills

Basic C++, Python, MS Excel, Vapor, gimp, Inkscape, Gmsh

Intermediate Bash scripting, Paraview, ESyS-Particle, POV-Ray, HTML, MODCON, MS Word, MS Powerpoint, various astronomy programs for observation planning-observing-data reduction-data analysis.

Expert IDL, ENVI, USGS ISIS3, SPINOR, STOPRO, iSALE-Hydrocode, iSALE-Plot, vimod, LaTeX, various programs for OSIRIS observation planning, observing, testing, validation, data reduction, data analysis.

List of selected refereed publications (out of 43)

- **Oklay N.**, Sunshine J. M., Sierks H., and the OSIRIS Team, Comparative study of water ice exposures on cometary nuclei using multispectral imaging data, in review
- **Oklay N.**, Vincent J.-B., Fornasier S., and the OSIRIS team, Variegation of comet 67P/Churyumov-Gerasimenko in the regions showing activity, A&A *(highlight)*, 2016, 586, A80

- **Oklay N.**, Vincent J.-B., Sierks H., and the OSIRIS team, Characterization of OSIRIS NAC filters for the interpretation of multispectral data of comet 67P/Churyumov-Gerasimenko, A&A Rosetta special issue, 2015, 583, A45
- Vincent J.-B., **Oklay N.**, Pajola M., and the OSIRIS team, Are fractured cliffs the source of cometary dust jets ? insights from OSIRIS/Rosetta at 67P, 2016, A&A, 587, A14
- Vincent J.-B., **Oklay N.**, Marchi S., Höfner S., Sierks H., Craters on comets, 2015, PSS, 107, 53-63
- Turini D, Combe J.-P., McCord T. B., **Oklay N.**, Vincent J.-B, Prettyman T. H., McSween H. Y., Consolmagno SJ G. J., De Sanctis M. C., Le Corre L., Longobardo A., Palomba E., Russell C. T., The contamination of the surface of Vesta by impacts and the delivery of the dark material, Icarus, 2014, 240, 86-102
- Pajola M., Lucchetti A., Vincent J.-B., **Oklay N.**, and the OSIRIS team, The southern hemisphere of 67P/Churyumov-Gerasimenko: Analysis of the preperihelion size-frequency distribution of boulders $\geq$7 m, 2016, A&A, 592, L2
- Pajola M., **Oklay N.**, La Forgia F., and the OSIRIS team, The Aswan site on comet 67P: geomorphology, boulder evolution and spectrophotometry, 2016, A&A, in press
- Knollenberg J., Lin Z. Y., Hiviid S., **Oklay N.**, and the OSIRIS team, A mini outburst from the nightside of comet 67P/Churyumov-Gerasimenko observed by the OSIRIS camera on Rosetta, 2016, A&A, in press
- Vincent J.-B., Bodewits D., Besse S., **and the OSIRIS team**, Large heterogeneities in comet 67P as revealed by active pits from sinkhole collapse, 2015, Nature, 523, 63V
- Massironi M., Simioni E., Marzari F., **and the OSIRIS team**, Two independent and primitive envelopes of the bilobate nucleus of comet 67P, 2015, Nature, 526, 402M
- El-Maary M.R., Thomas N., Gracia B., Marschall R., **and the OSIRIS team**, Fractures on comet 67P/Churyumov-Gerasimenko observed by Rosetta/OSIRIS, 2015, Geophysical Research Letters, 42, 5170E
- Rotundi A., Sierks H., Della Corte V., **et al.**, Dust measurements in the coma of comet 67P/Churyumov-Gerasimenko inbound to the Sun, 2015, Science, 347a3905R
- Sierks H., Barbieri C., Lamy P. **and the OSIRIS team**, On the nucleus structure and activity of comet 67P/Churyumov-Gerasimenko, 2015, Science, 347a1044S

- Thomas N., Sierks H., Barbieri C., Lamy P. **and the OSIRIS team**, The morphological diversity of comet 67P/Churyumov-Gerasimenko, 2015, Science, 347a0440T
- Pommerol A., Thomas N., El-Maary M. R., Pajola M., Groussin O., Auger A. T., **Oklay N.**, and the OSIRIS team, OSIRIS observations of meter-sized exposures of H2O ice at the surface of 67P/Churyumov-Gerasimenko and interpretation using laboratory experiments, 2015, 583, A25
- Fornasier S., Hasselmann P. H., Barucci M. A., Feller C., Besse S., Leyrat C., Lara L., Gutierrez P.J., **Oklay N.**, and the OSIRIS team, Spectrophotometric properties of the nucleus of comet 67P/Churyumov-Gerasimenko from the OSIRIS instrument onboard the ROSETTA spacecraft, 2015, 583, A30
- La Forgia F., Giacomini L., Lazzarin M., Massironi M., **Oklay N.**, and the OSIRIS team, Geomorphology and spectrophotometry of PhilaeŠs landing site on comet 67P/Churyumov-Gerasimenko, 2015, 583, A41
- Lucchetti A., Cremonese G., Jorda L., Bibring J.-P., Pajola M., La Forgia F., Massironi M., El-Maary R. M., **Oklay N.**, et al, Characterization of the Abydos region through OSIRIS high resolution images in support of CIVA measurements, 2016, A&A, 585, L1
- Cremonese G., Simioni E., Ragazzoni R., Bertini I., La Forgia F., Pajola M., **Oklay N.**, and the OSIRIS team, Photometry of dust grains of comet 67P and connection with nucleus regions insights from OSIRIS/Rosetta at 67P, 2016, A&A, 588, A59

Selected publications in progress

- **Oklay N.**, Vincent J.-B., Mottola S., Sierks H., and the OSIRIS Team, Temporal evolution of long-lived water ice rich deposits observed on comet 67P, in preparation
- **Oklay N.**, Vincent J.-B., Masoumzadeh N., Sierks H., Hall I., Colors of asteroid Lutetia's Baetica region, in preparation
- **Oklay N.**, Vincent J.-B., Sierks H., and the OSIRIS Team, Atlas of comet 67P's surface using OSIRIS NAC multispectral products, in preparation
- **Oklay N.**, Vincent J.-B., Elbeshausen D., Sierks H., Wünnemann K., Impact simulations of Massilia crater on asteroid (21)Lutetia, in preparation
- **Oklay N.**, Solanki S.K., Lagg A., Gandorfer A., Bianda M., Ramelli R., Temperature stratification of small scale magnetic features in the deep photospheric layers, submitted to A&A, in review
- Masoumzadeh N., **Oklay N.**, Kolokolova L., Sierks H., and the OSIRIS team, Opposition effect on comet 67P/Churyumov-Gerasimenko using Rosetta-OSIRIS images, 2016, in preparation

Popular science articles

- **Oklay, N.**, Kalkancı İ., Saygaç T., New World Under The Ice? (An overview about Jupiter's moon Europa), Tubitak Science and Technique Magazine, Vol.425, p.54-55, April 2003
- **Oklay, N.**, ISON kuyrukluyıldızına gökyüzünü süsleyecek mi?(Is comet ISON going to decorate our sky?), Tubitak Science and Technique Magazine, Vol.553, p.35-37, December 2013
- **Oklay, N.**, ISON kuyrukluyıldızına ne oldu? (What happened to comet ISON?), Tubitak Science and Technique Magazine, Vol.554, p.46-47, January 2014
- **Oklay, N.**, Avrupa'nın Kuyrukluyıldız Avcısı Rosetta Uyandı!(Europe's comet hunter Rosetta woke up!), Tubitak Science and Technique Magazine, Vol.557, p.36-39, April 2014

First author presentations in scientific conferences (planetary science related only)

- **Oklay N.**, and the OSIRIS Team, Temporal variation of long-lived water ice features observed on comet 67P via OSIRIS NAC multispectral images, Rosetta science meeting and SWT#45, 06-10 June 2016 in London, UK, *invited talk*
- **Oklay N.**, Sunshine J., Pajola M., and the OSIRIS team, Comparative study of icy patches on comet nuclei using multispectral imaging data, ESLAB50: From Giotto to Rosetta, 14-18 March 2016 in Leiden, Netherlands
- **Oklay N.**, Vincent J.-B., Fornasier S., and the OSIRIS team, Variegation of active regions on comet 67P/Churyumov-Gerasimenko, AAS/Division for Planetary Sciences Meeting #47, held 08-13 November 2015 in Washington D.C., The USA, id.#500.07
- **Oklay N.**, Vincent J.-B., Sierks H., and the OSIRIS team, Colors of active regions on comet 67P, European Planetary Science Congress 2015, held 27 September-02 October, 2015 in Nantes, France, id. EPSC2015-163
- **Oklay N.**, Vincent J.-B., Besse S., Colors of comet 67P/Churyumov-Gerasimenko's active pits and their surroundings as seen by OSIRIS on board Rosetta, European Geosciences Union General Assembly 2015, held 12-17 April, 2015 in Vienna, Austria, id. EGU2015-11341
- **Oklay N.** and Vincent J.-B., First time comet observations from National Observatory of Turkey, European Planetary Science Congress 2014, held 07-12 September, 2014 in Estoril, Cascais, Portugal, id. EPSC2014-158

- **Oklay N.** and Vincent J.-B., First-time comet observations at the National Observatory of Turkey, Asteroids, Comets, Meteors 2014, held 30 June-04 July, 2014 in Helsinki, Finland.
- **Oklay N.** et al., Spectral methods to detect cometary minerals with OSIRIS on board Rosetta, European Planetary Science Congress 2013, held 08-13 September, 2013 in London, UK., id. EPSC2013-610
- **Oklay N.** et al., Filter strategy for the characterization of minerals with OSIRIS, 44th Lunar and Planetary Science Conference, held March 18-22, 2013 in The Woodlands, Texas. LPI Contribution No. 1719, p.2399
- **Oklay N.** et al., Hydrocode modeling of the largest impact crater on Lutetia, a key to the inner structure of the asteroid, European Planetary Science Congress 2012, held 23-28 September, 2012 in Madrid, Spain, id. EPSC2012-510
- **Oklay N.** et al., Impacts on a Differentiated Lutetia, 43rd Lunar and Planetary Science Conference, held March 19-23, 2012 at The Woodlands, Texas. LPI Contribution No. 1659, id.1845

First author presentations in scientific conferences (solar science related only)

- **Oklay N.**, et al., Temperatures of small scale magnetic structures in deep solar photospheric layers, 38th COSPAR Scientific Assembly. Held 18-15 July 2010, in Bremen, Germany, p.7
- **Oklay N.**, et al., Spectropolarimetric Investigations of the Deep Photospheric Layers of Solar Magnetic Structures, Solar Polarization 5: In Honor of Jan Stenflo ASP Conference Series, Vol. 405, proceedings of the conference held 17-21 September, 2007 at Centro Stefano Franscini–Monte Veritá, Ascona, Switzerland. Edited by Svetlana V. Berdyugina, K. N. Nagendra, and Renzo Ramelli. San Francisco: Astronomical Society of the Pacific, 2009., p.233
- **Oklay N.** et al., Spectropolarimetric Investigations of the Deep Photospheric Layers of Magnetic Elements, 12^{th} European Solar Physics Meeting, Freiburg, Germany, held September, 8-12, 2008. Online at http://espm.kis.uni-freiburg.de, p.249
- **Oklay N.**, Variations in solar indices during the 23^{rd} solar cycle, Modern solar facilities - advanced solar science, Proceedings of a Workshop held at Göttingen September 27-29, 2006 ISBN 978-3-938616-84-0, p.197
- **Oklay N.**, The general properties of 23^{rd} solar cycle, Proceedings of the International Scientific Conference on Chromospheric and Coronal Magnetic Fields (ESA SP-596). 30 August - 2 September 2005, Katlenburg-Lindau, Germany. Editors: D.E. Innes, A. Lagg and S.K. Solanki, Published on CDROM, p.78.1