

Raphael Marschall

Curriculum Vita

General

e-mail marschall@cosmoculus.net
e-mail raphael.marschall@issibern.ch
ORCID ID 0000-0002-0362-0403

Education

- 2013 – 2017 *Ph.D. in Physics*
thesis Inner gas and dust comae of comets: Building a 3D simulation pipeline to understand multi-instrument results from the Rosetta mission to comet 67P/Churyumov-Gerasimenko
advisor Prof. Dr. Nicolas Thomas
University of Bern, Physics Institute, Space Research & Planetary Sciences Division, Planetary Imaging Group, Bern, Switzerland
- 2011 – 2012 *Master of Science in Physics with special qualifications in Theoretical Physics*
thesis Observer Dependence of Hawking Radiation
advisor Prof. Dr. Matthias Blau
University of Bern, Albert Einstein Center for Fundamental Physics, Institute for Theoretical Physics, Bern, Switzerland
- 2007 – 2011 *Bachelor of Science in Physics*
thesis The Hydrogen Atom in Dirac Theory
advisor Prof. Dr. Christoph Greub
University of Bern, Albert Einstein Center for Fundamental Physics, Institute for Theoretical Physics, Bern, Switzerland

Awards

- 2018 Faculty prize for the best Ph.D. thesis in Physics 2017; University of Bern, Faculty of Science, Switzerland

Employment

- 2017-present **MiARD Postdoc**, *International Space Science Institute, Bern, Switzerland.*
- 2013-2017 **Ph.D. Student**, *University of Bern, Physics Institute, Bern, Switzerland.*
- 2013-2016 **Teaching-Assistant**, *University of Bern, Physics Institute, Bern, Switzerland.*
Tutor for bachelor students with physics major in their 3rd & 4th semester.
Lectures: «Praktikum I», «Praktikum II»
- 2010-2011 **Teaching-Assistant**, *University of Bern, Institute for Theoretical Physics, Bern, Switzerland.*
Tutor for bachelor students with physics major in their 3rd – 6th semester.
Lectures: «Quantentheorie I», «Quantentheorie II», «Mathematische Methoden der Physik III», «Klassische Feldtheorie»

Publications

Papers as First Author

- [1] R. Marschall, S. Mottola, C. C. Su, Y. Liao, M. Rubin, J. S. Wu, N. Thomas, K. Altwegg, H. Sierks, W.-H. Ip, H. U. Keller, J. Knollenberg, E. Kührt, I. L. Lai, Y. Skorov, L. Jorda, F. Preusker, F. Scholten, J.-B. Vincent, Osiris Team, and Rosina Team. Cliffs versus plains: Can ROSINA/COPS and OSIRIS data of comet 67P/Churyumov-Gerasimenko in autumn 2014 constrain inhomogeneous outgassing? *Astronomy & Astrophysics*, 605:A112, September 2017.
- [2] R. Marschall, L. Rezac, D. Marshall, D. Kappel, C.C. Su, S.-B. Gerig, O. Pinzon, Y. Liao, M. Rubin, C. Hery, Hartogh. P., E. Kuehrt, S. Mottola, F. Preusker, F. Scholten, L. Jorda, A. Gracia-Berna, P. Theologou, O. Mousis, K. Dadzie, C. Christou, J.-S. Wu, K. Altwegg, and N. Thomas. A comparison of multiple Rosetta data sets and model calculations for the innermost coma of 67P for the period around equinox (May 2015). *in prep.*, 2018.
- [3] R. Marschall, C. C. Su, Y. Liao, N. Thomas, K. Altwegg, H. Sierks, W.-H. Ip, H. U. Keller, J. Knollenberg, E. Kührt, I. L. Lai, M. Rubin, Y. Skorov, J. S. Wu, L. Jorda, F. Preusker, F. Scholten, A. Gracia-Berná, A. Gicquel, G. Naletto, X. Shi, and J.-B. Vincent. Modelling observations of the inner gas and dust coma of comet 67P/Churyumov-Gerasimenko using ROSINA/COPS and OSIRIS data: First results. *Astronomy & Astrophysics*, 589:A90, May 2016.

Papers as Co-Author

- [4] M. R. El-Maarry, N. Thomas, A. Gracia-Berná, M. Pajola, J.-C. Lee, M. Massironi, B. Davidsson, S. Marchi, H. U. Keller, S. F. Hviid, S. Besse, H. Sierks, C. Barbieri, P. L. Lamy, D. Koschny, H. Rickman, R. Rodrigo, M. F. A'Hearn, A.-T. Auger, M. A. Barucci, J.-L. Bertaux, I. Bertini, D. Bodewits, G. Cremonese, V. Da Deppo, M. De Cecco, S. Debei, C. Güttler, S. Fornasier, M. Fulle, L. Giacomini, O. Groussin, P. J. Gutierrez, W.-H. Ip, L. Jorda, J. Knollenberg, G. Kovacs, J.-R. Kramm, E. Kührt, M. Küppers, L. M. Lara, M. Lazzarin, J. J. Lopez Moreno, R. Marschall, F. Marzari, G. Naletto, N. Oklay, A. Pommerol, F. Preusker, F. Scholten, C. Tubiana, and J.-B. Vincent. Regional surface morphology of comet 67P/Churyumov-Gerasimenko from Rosetta/OSIRIS images: The southern hemisphere. *Astronomy & Astrophysics*, 593:A110, September 2016.
- [5] M. R. El-Maarry, N. Thomas, A. Gracia-Berná, M. Pajola, J.-C. Lee, M. Massironi, B. Davidsson, S. Marchi, H. U. Keller, S. F. Hviid, S. Besse, H. Sierks, C. Barbieri, P. L. Lamy, D. Koschny, H. Rickman, R. Rodrigo, M. F. A'Hearn, A.-T. Auger, M. A. Barucci, J.-L. Bertaux, I. Bertini, D. Bodewits, G. Cremonese, V. Da Deppo, M. De Cecco, S. Debei, C. Güttler, S. Fornasier, M. Fulle, L. Giacomini, O. Groussin, P. J. Gutierrez, W.-H. Ip, L. Jorda, J. Knollenberg, G. Kovacs, J.-R. Kramm, E. Kührt, M. Küppers, L. M. Lara, M. Lazzarin, J. J. Lopez Moreno, R. Marschall, F. Marzari, G. Naletto, N. Oklay, A. Pommerol, F. Preusker, F. Scholten, C. Tubiana, and J.-B. Vincent. Regional surface morphology of comet 67P/Churyumov-Gerasimenko from Rosetta/OSIRIS images: The southern hemisphere (Corrigendum). *Astronomy & Astrophysics*, 598:C2, January 2017.
- [6] M. R. El-Maarry, Thomas, N., Giacomini, L., Massironi, M., Pajola, M., Marschall, R., Gracia-Berná, A., Sierks, H., Barbieri, C., Lamy, P. L., Rodrigo, R., Rickman, H., Koschny, D., Keller, H. U., Agarwal, J., A'Hearn, M. F., Auger, A.-T., Barucci, M. A., Bertaux, J.-L., Bertini, I., Besse, S., Bodewits, D., Cremonese, G., Da Deppo, V., Davidsson, B., De Cecco, M., Debei, S., Güttler, C., Fornasier, S., Fulle, M., Groussin, O., Gutierrez, P. J., Hviid, S. F., Ip, W.-H., Jorda, L., Knollenberg, J., Kovacs, G., Kramm, J.-R., Kührt, E., Küppers, M., La Forgia, F., Lara, L. M., Lazzarin, M., Lopez Moreno, J. J., Marchi, S., Marzari, F., Michalik, H., Naletto, G., Oklay, N., Pommerol, A., Preusker, F., Scholten, F., Tubiana, C.,

and Vincent, J.-B. Regional surface morphology of comet 67p/churyumov-gerasimenko from rosetta/osiris images. *Astronomy & Astrophysics*, 583:A26, 2015.

- [7] S.-B. Gerig, R. Marschall, N. Thomas, I. Bertini, D. Bodewits, B. Davidsson, M. Fulle, W.-H. Ip, H.U. Keller, M. Küppers, F. Preusker, F. Scholten, C.C. Su, I. Toth, C. Tubiana, J.-S. Wu, H. Sierks, Barbieri C., P.L. Lamy, R. Rodrigo, D. Koschny, H. Rickman, J. Agarwal, M.A. Barucci, J.-L. Bertaux, G. Cremonese, V. Da Deppo, S. Debei, M. De Cecco, J. Deller, S. Fornasier, O. Groussin, P.J. Gutierrez, C. Güttler, S.F. Hviid, L. Jorda, J. Knollenberg, J.R. Kramm, E. Kührt, L.M. Lara, M. Lazzarin, J. Lopez Moreno, F. Marzari, S. Mottola, G. Naletto, N. Oklay, and J.-B. Vincent. On deviations from free-radial outflow in the inner coma of comet 67P/Churyumov-Gerasimenko. *Icarus*, page submitted, 2017.
- [8] Y. Liao, C.-C. Su, R. Marschall, I.-L. Lai, Pinzon. O., J.-S. Wu, and N. Thomas. Water Vapor Recondensation from Inner Gas Coma onto the Nucleus of Comet 67P/Churyumov-Gerasimenko. *Planetary Space Science*, page submitted, 2017.
- [9] Y. Liao, C. C. Su, R. Marschall, J. S. Wu, M. Rubin, I. L. Lai, W. H. Ip, H. U. Keller, J. Knollenberg, E. Kührt, Y. V. Skorov, and N. Thomas. 3D Direct Simulation Monte Carlo Modelling of the Inner Gas Coma of Comet 67P/Churyumov-Gerasimenko: A Parameter Study. *Earth, Moon, and Planets*, 117:41–64, March 2016.
- [10] A. Pommerol, N. Thomas, M. R. El-Maarry, M. Pajola, O. Groussin, A.-T. Auger, N. Oklay, S. Fornasier, C. Feller, B. Davidsson, A. Gracia-Berná, B. Jost, R. Marschall, O. Poch, M. A. Barucci, J.-L. Bertaux, F. La Forgia, H. U. Keller, E. Kührt, S. C. Lowry, S. Mottola, G. Naletto, H. Sierks, C. Barbieri, P. L. Lamy, R. Rodrigo, D. Koschny, H. Rickman, J. Agarwal, M. F. A'Hearn, I. Bertini, S. Boudreault, G. Cremonese, V. Da Deppo, M. De Cecco, S. Debei, C. Güttler, M. Fulle, P. J. Gutierrez, S. F. Hviid, W.-H. Ip, L. Jorda, J. Knollenberg, G. Kovacs, J.-R. Kramm, E. Küppers, L. Lara, M. Lazzarin, J. L. Lopez Moreno, F. Marzari, H. Michalik, F. Preusker, F. Scholten, C. Tubiana, and J.-B. Vincent. OSIRIS observations of meter-sized exposures of H₂O ice at the surface of 67P/Churyumov-Gerasimenko and interpretation using laboratory experiments. *Astronomy & Astrophysics*, 583:A25, November 2015.
- [11] Y. Skorov, V. Reshetnyk, L. Rezac, Y. Zhao, R. Marschall, J. Blum, and P. Hartogh. Hierarchical dust in the vicinity of comet 67P: Dynamical properties and acceleration of hierarchical dust in the vicinity of comet 67P/Churyumov-Gerasimenko. *Monthly Notices of the RAS*, page submitted, 2018.
- [12] N. Thomas, B. Davidsson, M. R. El-Maarry, S. Fornasier, L. Giacomini, A. G. Gracia-Berná, S. F. Hviid, W.-H. Ip, L. Jorda, H. U. Keller, J. Knollenberg, E. Kührt, F. La Forgia, I. L. Lai, Y. Liao, R. Marschall, M. Massironi, S. Mottola, M. Pajola, O. Poch, A. Pommerol, F. Preusker, F. Scholten, C. C. Su, J. S. Wu, J.-B. Vincent, H. Sierks, C. Barbieri, P. L. Lamy, R. Rodrigo, D. Koschny, H. Rickman, M. F. A'Hearn, M. A. Barucci, J.-L. Bertaux, I. Bertini, G. Cremonese, V. Da Deppo, S. Debei, M. de Cecco, M. Fulle, O. Groussin, P. J. Gutierrez, J.-R. Kramm, M. Küppers, L. M. Lara, M. Lazzarin, J. J. Lopez Moreno, F. Marzari, H. Michalik, G. Naletto, J. Agarwal, C. Güttler, N. Oklay, and C. Tubiana. Redistribution of particles across the nucleus of comet 67P/Churyumov-Gerasimenko. *Astronomy & Astrophysics*, 583:A17, November 2015.