Anni Määttänen

Liste de Publications/Publication list

12.5.2026

Publications

Chapitres d'ouvrages / Book chapters

5. **Anni Määttänen** & Montmessin, F. (2021, April 26). Clouds in the martian atmosphere. In *Oxford Research Encyclopedia of Planetary Science*. Oxford University Press. doi: https://doi.org/10.1093/acrefore/9780190647926.013.114

4. J. M. C. Plane, G. J. Flynn, **Anni Määttänen**, J. E. Moores, A. R. Poppe, J. Di.Carrillo-Sanchez and C. Listowski (2018): Impacts of Cosmic Dust on Planetary Atmospheres and Surfaces. Chapter in:"Cosmic Dust from the Lab to the Stars", published in Space Science Reviews, accepted for publication. See item 31 in the list of articles below.

3. F. Montmessin, **Anni Määttänen**: Temperature, Clouds and Aerosols in the Terrestrial Bodies of the Solar System. (2017) Editors: Dr. Hans J. Deeg, Dr. Juan Antonio Belmonte, Handbook of Exoplanets, Springer, ISBN: 978-3-319-30648-3 (Print) 978-3-319-30648-3 (Online).

2. P. Read **et al.** (2017): The Martian Planetary Boundary Layer (chapter). In: Robert M. Haberle, R. Todd Clancy, François Forget, Michael D. Smith, Richard W. Zurek (Eds), The Atmosphere and Climate of Mars, Cambridge University Press, ISBN: 978-1-1070-1618-7.

1. **Anni Määttänen**, K. Pérot, F. Montmessin, A. Hauchecorne (2013): Mesospheric clouds on Mars and on the Earth. Chapter 16 in: S. Mackwell, A. A. Simon-Miller, M. Bullock, and J. Harder (Eds), Comparative Climatology of the Terrestrial Planets, University of Arizona Press. ISBN: 978-0-8165-3059-5 | eISBN: 978-0-8165-9975-2.

Articles à comité de lecture / Peer-reviewed articles

2026

68. B. H. Redmond Roche et al. (2026): Differentiating Solar Radiation Modification Field Experiments: Scale, Technical Characteristics, and Governance Implications. *Accepted for publication in Earth's Future*, DOI: 10.1029/2025EF007303

67. I. Hernandez-Galindo et al. (2026): Past Field Experiments of Solar Radiation Modification: A Review of the Scientific and Technical Aspects for Governance. *Accepted for publication in Earth's Future*, DOI: 10.1029/2025EF007254

66. M. Lefèvre, F. Lefèvre, **Anni Määttänen**, R. Skog, B. Frandsen, A. Stolzenbach, A. Braude (2026): The Impact of the sulfur allotropes and sulfur hydrides on the Venus cloud chemistry. Journal of Geophysical Research: Planets, 131, e2025JE009523. https://doi.org/10.1029/2025JE009523

65. N. Streel, F. Lefèvre, A. Martinez, **Anni Määttänen**, A. Stolzenbach, S. Lebonnois, J.-C. Gérard, L. Soret (2026): Strong variability of the modeled Venus NO nightglow. Journal of Geophysical Research: Planets, 131, e2025JE009316. https://doi.org/10.1029/2025JE009316

64. H. Karyu, T. Kuroda, **Anni Määttänen**, A. Mahieux, S. Viscardy, N. Terada, S. Robert, A. C. Vandaele, M. Crucifix (2026): A cosmic origin of Venus' lower haze. Nature Astronomy. DOI: 10.1038/s41550-026-02843-4

63. **Anni Määttänen**, F. Ravetta, J. Bureau, T. Lurton and O. Boucher (2026): Idealized modeling of stratospheric aerosol injection deployment scenarios with two noncooperative actors. Environmental Science: Atmospheres, 2026, 6, 324 - 337 DOI: 10.1039/d5ea00022j

2025

62. He, Z. S. Vinatier, V. Eymet, V. Forest, B. Bézard, P. Rannou, S. Rodriguez, E. Marcq, R. Fournier, S. Blanco, N. Mourtaday, Y. Nyffenegger-Péré, S. Lebonnois, **Anni Määttänen** (2025). Simultaneous estimation of radiance and its sensitivities to radiative properties in a spherical-heterogeneous atmospheric radiative transfer model by Monte Carlo method: Application to Titan. Accepted for publication in Journal of Quantitative Spectroscopy and Radiative Transfer, 109722, https://doi.org/10.1016/j.jqsrt.2025.109722.

61. Karyu H., T. Kuroda, A. Mahieux, S. Viscardy, **A. Määttänen**, N. Terada, S. Robert, A. C. Vandaele, and M. Crucifix (2025). A Microphysics Model of Multicomponent Venus' Clouds with a High-Accuracy Condensation Scheme. Earth and Space Science, 12, e2025EA004203. https://doi.org/10.1029/2025EA004203.

60. Martin, P., D. Titov, C. Wilson, A. Cardesín-Moinelo, J. Godfrey, J.-P. Bibring, F. González-Galindo, R. Jaumann, **A. Määttänen**, T. Spohn, G. Kminek & E. Sefton-Nash (2025). Mars Express: From the Launch Pad to a 20-Year Success Record at Mars. Space Sci Rev 221, 48. https://doi.org/10.1007/s11214-025-01174-6

2024

59. Vandaele, A. C., S. Aoki, S. Bauduin, F. Daerden, A. Fedorova, M. Giuranna, O. Korablev, F. Lefèvre, **Anni Määttänen**, F. Montmessin, M. R. Patel, M. Smith, L. Trompet, S. Viscardy, Y. Willame and N. Yoshida (2024). Composition and Chemistry

of the Martian Atmosphere as Observed by Mars Express and ExoMars Trace Gas Orbiter. Space Science Reviews **220**, 75. https://doi.org/10.1007/s11214-024-01109-7

58. **Anni Määttänen**, T. Lameille, C. Kloeck, O. Boucher, F. Ravetta (2024): Uncertainties and confidence in stratospheric aerosol injection modelling: a systematic literature review. Oxford Open Climate Change, 4(1), kgae007, https://doi.org/10.1093/oxfclm/kgae007

57. **Anni Määttänen**, A. Fedorova, M. Giuranna, J. Hernández-Bernal, Y. Leseigneur, F. Montmessin, K. S. Olsen, A. Sánchez-Lavega, A. Stcherbinine, A. Szantai, D. Tirsch, M. Vincendon, Y. Willame, P. Wolkenberg (2024): Dust and clouds on Mars: the view from Mars Express. Space Science Reviews 220(63). https://doi.org/10.1007/s11214-024-01092-z

56. M. Lefèvre, F. Lefèvre, E. Marcq, **Anni Määttänen**, A. Stolzenbach, N. Streel (2024): Impact of the Turbulent Vertical Mixing on Chemical and Cloud Species in the Venus Cloud Layer. Geophysical Research Letters, 51, e2024GL108771. https://doi.org/10.1029/2024GL108771

55. V. Caillé, A. Spiga, **Anni Määttänen**, L. Falletti, C. Mathé (2024): Resolving Convection of CO_2 Ice Clouds in the Martian Polar Nights. Geophysical Research Letters, 51, e2023GL106923. https://doi.org/10.1029/2023GL106923

54. Cardesin-Moinelo, A., J. Godfrey, E. Grotheer, R. Blake, S. Damiani, S. Wood, T. Dressler, M. Bruno, A. Johnstone, L. Lucas, J. Marin-Yaseli de la Parra, D. Merritt, M. Sierra, **Anni Määttänen**, G. Antoja-Lleonart, M. Breitfellner, C. Muniz, F. Nespoli, L. Riu, M. Ashman, A. Escalante, B. Geiger, D. Heather, A. Hepburn, V. Pistone, F. Raga, R. Valles, V. Companys, P. Martin & C. Wilson Mars Express: 20 Years of Mission, Science Operations and Data Archiving. Space Sci Rev 220, 25 (2024). https://doi.org/10.1007/s11214-024-01059-0.

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53. B. J. Murray, T. P. Mangan, **Anni Määttänen** and J. M. C. Plane (2023). Ephemeral ice clouds in the upper mesosphere of Venus. *Journal of Geophysical Research: Planets*, 128, e2023JE007974. https://doi.org/10.1029/2023JE007974

52. Marek Slipski, Armin Kleinböhl, Daniela Tirsch, Gerhard Kminek, Gregory Jonniaux, Klaus-Dieter Matz, **Anni Määttänen**, Austin Nicholas, Franck Montmessin, Soren N. Madsen, Matthew Abrahamson, Manuel Sanchez-Gestido, Michael A. Mischna, Neil Paul Murray, Michael J. Wolff, Pierre Blanc-Paques, Fabrice Cipriani, Colin F. Wilson, Dmitri Titov, Richard Zurek (2023). The radiometric environment for Mars limb observations by the Mars Sample Return Earth Return Orbiter. Advances in Space Research. https://doi.org/10.1016/j.asr.2023.07.019.

51. Braude, A. S., F. Montmessin, N. M. Schneider, S. Gupta, S. K. Jain, F. Lefèvre,

Anni Määttänen, L. Verdier, Z. Flimon, F. Y. Jiang, R. V. Yelle, J. Deighan, S. M. Curry (2023). Seasonal, latitudinal, and longitudinal trends in night-time ozone vertical structure on Mars from MAVEN/IUVS stellar occultations. Journal of Geophysical Research: Planets, 128, e2022JE007697. https://doi.org/10.1029/2022JE007697

50. A. Piccialli, A. C. Vandaele, Y. Willame, **Anni Määttänen**, L. Trompet, J.T. Erwin, F. Daerden, L. Neary, S. Aoki, S. Viscardy, I. R. Thomas, C. Depiesse, B. Ristic, J. P. Mason, M. R. Patel, M.J. Wolff, A.S.J. Khayat, G. Bellucci, J.-J. Lopez-Moreno (2023). Martian ozone observed by TGO/NOMAD-UVIS solar occultation: an inter-comparison of three retrieval methods. Earth and Space Science, 10, e2022EA002429. https://doi.org/10.1029/2022EA002429.

49. A. Stolzenbach, F. Lefèvre, S. Lebonnois, **Anni Määttänen** (2023), Three-dimensional modelling of Venus photochemistry and clouds, Icarus 395, 115447, https://doi.org/10.1016/j.icarus.2023.115447.

48. V. Caillé, **Anni Määttänen**, A. Spiga, L. Falletti (2023). Revisiting Atmospheric Features of Mars Orbiter Laser Altimeter Data using Machine Learning Algorithms. Journal of Geophysical Research. Planets, 128, e2022JE007384, doi:10.1029/2022JE007384.

47. **Anni Määttänen**, S. Guilbon, J. Burgalat, F. Montmessin (2023). Development of a new cloud model for Venus (MAD-VenLA) using the Modal Aerosol Dynamics approach, Advances in Space Research 71, 1, pp. 1116-1136, https://doi.org/10.1016/j.asr.2022.09.063.

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46. T. Bertrand, M. Kahre, R. Urata, **Anni Määttänen**, F. Montmessin, J. Wilson, M. Wolff (2022). Impact of the coagulation of dust particles on Mars during the 2018 global dust storm Icarus 388, 115239, https://doi.org/10.1016/j.icarus.2022.115239

45. **Anni Määttänen**, F. Lefèvre, L. Verdier, F. Montmessin, C. Listowski, S. Guilbon, A. Fedorova, O. Korablev (2022). Ozone vertical distribution in Mars Years 27–30 from SPICAM/MEX UV occultations, Icarus, 115162, https://doi.org/10.1016/j.icarus.2022.115162.

44. **Anni Määttänen**, C. Mathé, J. Audouard, C. Listowski, E. Millour, F. Forget, F. González-Galindo, L. Falletti, D. Bardet, L. Teinturier, M. Vals, A. Spiga, F. Montmessin (2022). Troposphere-to-mesosphere microphysics of carbon dioxide ice clouds in a Mars Global Climate Model, Icarus, 115098, https://doi.org/10.1016/j.icarus.2022.115098.

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43. Lefèvre, F., Trokhimovskiy, A., Fedorova, A., Baggio, L., Lacombe, G., **Anni Määttänen**, et al. (2021). Relationship between the Ozone and Water Vapor columns on Mars as Observed by SPICAM and Calculated by a Global Climate Model. Journal of Geophysical Research: Planets, 126, e2021JE006838. https://doi.org/10.1029/2021JE006838

42. A. Piccialli, A.C. Vandaele, L. Trompet, L. Neary, S. Viscardy, J.T. Erwin, **Anni Määttänen**, F. Daerden, Y. Willame, S. Robert, S. Aoki, V. Wilquet, F. Lefèvre, F. Montmessin (2021). Impact of gradients at the martian terminator on the retrieval of ozone from SPICAM/MEx, Icarus, 353, 113598, https://doi.org/10.1016/j.icarus.2019.113598.

2020

41. A. Piccialli, J. A. Rathbun, A.-C. Levasseur-Regourd, **Anni Määttänen**, A. Milillo, M. Rengel, A. Rotundi, M. Taylor, O. Witasse, F. Altieri, P. Drossart, and A. C. Vandaele: Participation of women scientists in ESA solar system missions: a historical trend. Adv. Geosci., 53, 169–182, 2020.

40. Erard, S., Cecconi, B., Le Sidaner, P., Chauvin, C., Rossi, A.P., Minin, M., Capria, T., Ivanovski, S., Schmitt, B., Génot, V., André, N., Marmo, C., Vandaele, A.C., Trompet, L., Scherf, M., Hueso, R., **Anni Määttänen**, Carry, B., Achilleos, N., Soucek, J., Pisa, D., Benson, K., Fernique, P. and Millour, E., 2020. Virtual European Solar & Planetary Access (VESPA): A Planetary Science Virtual Observatory Cornerstone. Data Science Journal, 19(1), p.22. DOI: http://doi.org/10.5334/dsj-2020-022. arXiv https://arxiv.org/abs/1907.06521

39. D. Banfield, A. Spiga, C. Newman, F. Forget, M. Lemmon, R. Lorenz, N. Murdoch, D. Viudez-Moreiras, J. Pla-Garcia, R. Garcia, P. Lognonné, C. Perrin, L. Martire, Ö. Karatekin, N. Teanby, B. Van Hove, J. Maki, B. Kenda, N. Mueller, S. Rodriguez, T. Kawamura, J. McClean, A. Stott, C. Charalambous, E. Millour, C. Johnson, A. Mittelholz, **Anni Määttänen**, S. Lewis, C. John, S. Stähler, S. Ceylan, D. Giardini, T. Warren, W. Pike, I. Daubar, M. Golombek, L. Rolland, R. Widmer-Schnidrig, D. Mimoun, E. Beucler, A. Jacob, A. Lucas, M. Baker, V. Ansan, K. Hurst, L. Mora-Sotomayor, S. Navarro Lopez, J. Torres, A. Lepinette, A. Molina, M. Marin-Jimenez, J. Gomez-Elvira, V. Peinado, J. Rodriguez-Manfredi, B. Carcich, S. Sackett, C. Russell, T. Spohn, S. Smrekar, and W. Banerdt (2020): The atmosphere of Mars as observed by InSight. Nature Geoscience. https://doi.org/10.1038/s41561-020-0534-0

38. A. A. Fedorova, F. Montmessin, O. Korablev, M. Luginin, A. Trokhimovskiy, D. A. Belyaev, N. I. Ignatiev, F. Lefèvre, J. Alday, P. G. J. Irwin, K. S. Olsen, J.-L. Bertaux, E. Millour, **Anni Määttänen**, A. Shakun, A. V. Grigoriev, A. Patrakeev, S. Korsa, N. Kokonkov, L. Baggio, F. Forget, C. F. Wilson (2020): Stormy water on Mars: the distribution and saturation of atmospheric water during the dusty season. Science, aay9522. DOI: 10.1126/science.aay9522.

2019

[The following article was withdrawn by the authors due to data error: bias caused by atmospheric dust is currently being corrected by the SPICAM team and resubmission of the paper is planned before end of 2020.] **Anni Määttänen**, F. Lefèvre, F. Montmessin, C. Listowski, S. Guilbon, A. Fedorova, O. Korablev (2019). Climatology of the ozone vertical distribution on Mars from SPICAM/MEX UV occultations. Icarus. https://doi.org/10.1016/j.icarus.2019.113428

37. Oleg Korablev, Ann Carine Vandaele, Franck Montmessin, Anna A. Fedorova, Alexander Trokhimovskiy, François Forget, Franck Lefèvre, Frank Daerden, Ian R. Thomas, Loïc Trompet, Justin T. Erwin, Shohei Aoki, Séverine Robert, Lori Neary, Sébastien Viscardy, Alexey V. Grigoriev, Nikolay I. Ignatiev, Alexey Shakun, Andrey Patrakeev, Denis A. Belyaev, Jean-Loup Bertaux, Kevin S. Olsen, Lucio Baggio, Juan Alday, Yuriy S. Ivanov, Bojan Ristic, Jon Mason, Yannick Willame, Cédric Depiesse, Laszlo Hetey, Sophie Berkenbosch, Roland Clairquin, Claudio Queirolo, Bram Beeckman, Eddy Neefs, Manish R. Patel, Giancarlo Bellucci, Jose-Juan Lopez-Moreno, Colin F. Wilson, Giuseppe Etiope, Lev Zelenyi, Håkan Svedhem, Jorge L. Vago & the **ACS** & NOMAD **Team** : No detection of methane on Mars from early ExoMars Trace Gas Orbiter observations. Nature, April 2019, https://doi.org/10.1038/s41586-019-1096-4.

36. Ann Carine Vandaele, Oleg Korablev, Frank Daerden, Shohei Aoki, Ian R. Thomas, Francesca Altieri, Miguel López-Valverde, Geronimo Villanueva, Giuliano Liuzzi, Mike Smith, Justin Erwin, Loïc Trompet, Anna A. Fedorova, Franck Montmessin, Alexander Trokhimovskiy, Denis Belyaev, Nikolay Ignatiev, Mikhail Luginin, David Bolsée, Todd Clancy, Ed Cloutis, Cédric Depiesse, Jean-Claude Gérard, Marco Giuranna, Bernd Funke, Maia Garcia-Comas, Francisco Gonzalez-Galindo, Jacek Kaminski, Ozgur Karatekin, Frank Lefèvre, Manuel López-Puertas, Arnaud Mahieux, Jon Mason, Mike Mumma, Lori Neary, Eddy Neefs, Bojan Ristic, Séverine Robert, Frédéric Schmidt, Nicholas A. Teanby, Sébastien Viscardy, Yannick Willame, James Whiteway, Valérie Wilquet, Mike Wolff, Alexey Grigoriev, Alexey Shakun, Andrey Patrakeev, Igor Maslov, Dmitry Patsaev, Daria Betsis, Jean Loup Bertaux, Giancarlo Bellucci, Manish R. Patel, Jose-Juan Lopez-Moreno, François Forget, Colin Wilson, Håkan Swedhem, Jorge L. Vago, D. Rodionov, and the NOMAD and **ACS teams** : Martian dust storm impact on atmospheric H_2O and D/H observed by ExoMars Trace Gas Orbiter. Nature, April 2019, https://doi.org/10.1038/s41586-019-1097-3

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35. A. Sánchez-Lavega, A. Garro, T. del Río-Gaztelurrutia, R. Hueso, I. Ordoñez-Etxeberria, H. Chen Chen, A. Cardesín-Moinelo, D. Titov, S. Wood, M. Almeida, A. Spiga, F. Forget, **Anni Määttänen**, H. Hoffmann, B. Gondet (2018). A seasonally recurrent annular cyclone in Mars northern latitudes and observations of a companion vortex. Journal of Geophysical Research: Planets, 123, 3020-3034. https://doi.org/10.1029/2018JE005740

34. Plane, J. M. C., Carrillo-Sanchez, J. D., Mangan, T. P., Crismani, M. M. J., Schneider, N. M. and **Anni Määttänen** (2018). Meteoric Metal Chemistry in the Martian

Atmosphere. Journal of Geophysical Research: Planets, 123, 695–707. https://doi.org/10.1002/2017JE005510

33. Miguel A. Lopez-Valverde, Jean-Claude Gerard, Francisco Gonzalez-Galindo, Ann-Carine Vandaele, Ian Thomas, Oleg Korablev, Nikolai Ignatiev, Anna Fedorova, Franck Montmessin, **Anni Määttänen**, Sabrina Guilbon, Franck Lefevre, Manish R. Patel, Sergio Jimenez-Monferrer, Maya Garcia-Comas, Alejandro Cardesin, Colin F. Wilson, R. T. Clancy, Armin Kleinboehl, Daniel J. McCleese, David M. Kass, Nick M. Schneider, Michael S. Chaffin Jose Juan Lopez-Moreno, Julio Rodriguez (2018), Investigations of the Mars upper atmosphere with Exomars Trace Gas Orbiter. Space Sci Rev (2018) 214: 29.

32. **Anni Määttänen**, J. Merikanto, H. Henschel, J. Duplissy, R. Makkonen, I. K. Ortega and H. Vehkamäki (2018), New parameterizations for neutral and ion-induced sulfuric acid-water particle formation in nucleation and kinetic regimes, J. Geophys. Res. Atmos., 122, doi:10.1002/2017JD027429.

31. J. M. C. Plane, G. J. Flynn, **Anni Määttänen**, J. E. Moores, A. R. Poppe, J. Di.Carrillo-Sanchez and C. Listowski (2018): Impacts of Cosmic Dust on Planetary Atmospheres and Surfaces. Space Science Reviews 214:23. (Chapter in: "Cosmic Dust from the Lab to the Stars", see item 4 in the list of book chapters above).

30. O. Korablev, F. Montmessin, A. Trokhimovskiy, A.A. Fedorova, A.V. Shakun, A.V. Grigoriev, B.E. Moshkin, N.I. Ignatiev, F. Forget, F. Lefevre, K. Anufreychik, I. Dzuban, Y. S. Ivanov, Y.K. Kalinnikov, T.O. Kozlova, A. Kungurov, V. Makarov, F. Martynovich, I. Maslov, D. Merzlyakov, P. P. Moiseev, Y. Nikolskiy, A. Patrakeev, D. Patsaev, A. Santos-Skripko, O. Sazonov, N. Semena, A. Semenov, V. Shashkin, A. Sidorov, A.V. Stepanov, I. Stupin, D. Timonin, A.Y. Titov, A. Viktorov, A. Zharkov, F. Altieri, G. Arnold, D.A. Belyaev, J.L. Bertaux, D.S. Betsis, N. Duxbury, T. Encrenaz, T. Fouchet, J.-C. Gerard, D. Grassi, S. Guerlet, P. Hartogh, Y. Kasaba, I. Khatuntsev, V.A. Krasnopolsky, R.O. Kuzmin, E. Lellouch, M.A. Lopez-Valverde, M. Luginin, **Anni Määttänen**, E. Marcq, J. Martin Torres, A.S. Medvedev, E. Millour, K.S. Olsen, M.R. Patel, C. Quantin-Nataf, A.V. Rodin, V. I. Shematovich, I. Thomas, N. Thomas, L. Vazquez, M. Vincendon, V. Wilquet, C.F. Wilson, L.V. Zasova, L.M. Zelenyi, M.P. Zorzano (2018), "The Atmospheric Chemistry Suite (ACS) of Three Spectrometers for the ExoMars 2016 Trace Gas Orbiter", Space Sci Rev 214(7), DOI 10.1007/s11214-017-0437-6.

29. S. Erard, B. Cecconi, P. Le Sidaner, A.P. Rossi, M.T. Capria, B. Schmitt, V. Génot, N. André, A.C. Vandaele, M. Scherf, R. Hueso, **Anni Määttänen**, W. Thuillot, B. Carry, N. Achilleos, C. Marmo, O. Santolik, K. Benson, P. Fernique, L. Beigbeder, E. Millour, B. Rousseau, F. Andrieu, C. Chauvin, M. Minin, S. Ivanoski, A. Longobardo, P. Bollard, D. Albert, M. Gangloff, N. Jourdane, M. Bouchemit, J.-M. Glorian, L. Trompet, T. Al-Ubaidi, J. Juaristi, J. Desmars, P. Guio, O. Delaa, A. Lagain, J. Soucek, D. Pisa (2018), VESPA: A community-driven Virtual Observatory in Planetary Science, Planetary and Space Science 150, 65-85.

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28. F. Montmessin, O. Korablev, F. Lefèvre, J.-L. Bertaux, A. Fedorova, A. Trokhimovskiy, G. Lacombe, A. Reberac, L. Maltagliati, Y. Willame, S. Guslyakova, J.-C. Gérard, A. Stiepen, D. Fussen, N. Mateshvili, **Anni Määttänen**, F. Forget, O. Witasse, F. Leblanc, A.C. Vandaele, E. Marcq, B. Sandel, B. Gondet, N. Schneider, M. Chaffin, N. Chapron (2017), SPICAM on Mars Express: a 10 year in-depth survey of the Martian atmosphere, Icarus 297, 195-216, http://dx.doi.org/10.1016/j.icarus.2017.06.022.

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27. Piccialli A., M.A. López-Valverde, **A. Määttänen**, F. González-Galindo, J. Audouard, F. Altieri, F. Forget, P. Drossart, B. Gondet, and J.-P. Bibring (2016), CO_2 non-LTE limb emissions in Mars' atmosphere as observed by OMEGA/Mars Express, J. Geophys. Res. Planets, 121, doi:10.1002/2015JE004981.

26. Merikanto, J., J. Duplissy, **A. Määttänen**, H. Henschel, N. M. Donahue, D. Brus, S. Schobesberger, M. Kulmala, and H. Vehkamäki (2016), Effect of ions on sulfuric acid-water binary particle formation I: Theory for kinetic and nucleation-type particle formation and atmospheric implications. J. Geophys. Res. Atmos., 121, 1736-1751, doi:10.1002/2015JD023538.

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24. B. Fleury, N. Carrasco, E. Marcq, L. Vettier, **Anni Määttänen**, Water formation in the upper atmosphere of the early Earth . Astrophysical Journal (The), IOP Science, 2015, 807 (2), pp. L29. doi: 10.1088/2041-8205/807/2/L29

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23. **Anni Määttänen**, M. Douspis: Estimating the variability of contact parameter temperature dependence with the Monte Carlo Markov Chain method. GeoResJ 3-4, 46-55, 2014. doi: 10.1016/j.grj.2014.09.002

22. T. Navarro, J.-B. Madeleine, F. Forget, A. Spiga, E. Millour, F. Montmessin and **Anni Määttänen**: Global Climate Modeling of the Martian water cycle with improved microphysics and radiatively active water ice clouds. J. Geophys. Res. 119(7), 1479-1495, 2014, doi: 10.1002/2013JE004550.

21. J.-B. Madeleine, J. W. Head, F. Forget, T. Navarro, E. Millour, A. Spiga, A. Colaïtis, **Anni Määttänen**, F. Montmessin, J. L. Dickson: Recent Ice Ages on Mars: The Role of Radiatively Active Clouds and Cloud Microphysics. Geophys. Res. Lett. 41(14), 4873-

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