

- Identification

Name: Fernando António dos Santos Simões

Date of Birth: 10 September 1969

Nationality: Portuguese

Identity Card: 8545927

Passport: J787428

Place of Birth:

Arganil, Portugal

Address:

Rua Vale Milho, 58

2725-150 Algueirão

Portugal

Phone:

Office: 304 505 505

Fax: 304 505 506

Mobile: 910 165 991

Email: fernandosimoes@ymail.com



- Highlights

- ✓ Member of the NASA Planetary Atmospheres Review Panel;
- ✓ Postdoc at NASA/GSFC, Heliophysics Science Division, Space Weather Laboratory (code 674), MD, USA;
- ✓ Postdoc at LATMOS/CNRS, Paris, France;
- ✓ PhD thesis: seven peer-reviewed papers, including three as first author and one in Nature with more than 400 citations;
- ✓ Research at RSSD ESA/ESTEC, Noordwijk, The Netherlands;
- ✓ Research in the Materials Department at Instituto Superior Técnico, Lisbon, Portugal;
- ✓ He holds nine patents (one in aerogels) and dozens of peer-reviewed articles in the fields of optoelectronics, lidar, materials science, Earth and planetary science, astronomy and astrophysics, and space instrumentation.

- Academic Degrees

BSc degree in Technological Physics Engineering from Universidade Técnica de Lisboa (UTL) at Instituto Superior Técnico (IST), Lisbon, Portugal, since July 1992. This is a 5-year program accomplished in 5-years, with most courses covering theoretical and applied physics, and mathematics.

MSc degree in Astrophysics from IST/UTL, since April 1996, with the thesis *Pulsar electrodynamics – surface and atmosphere of neutron stars and associated electromagnetic fields*, supervised by António A. da Costa. This is a 2-year program accomplished in 2-years, combined with lecturer activity.

PhD degree in Space Physics from Université Pierre et Marie Curie, Paris 6, France, since December 2007, with the thesis *Theoretical and experimental studies of electromagnetic resonances in the ionospheric cavities of planets and satellites; instrument and mission perspectives*, supervised by Michel Hamelin. This is a 4-year program accomplished in 2-years (exemption from attending courses was granted).

- Employment

1992-1996 ⇒ MSc in Astrophysics (1994-1996) combined with lecturer activity (1992-1996) of *Classical Mechanics* and *Computational Physics* in the Department of Physics of Instituto Superior Técnico, Lisbon, Portugal.

1996-2002 ⇒ Research activity in the Department of Materials Science at IST. Research topics included laser materials processing, surface marking and engraving, and lidar applications.

2002-2004 ⇒ Research activity in Planetary and Space Science at the *European Space research and TEchnology Centre* (ESTEC) of the *European Space Agency* (ESA), Noordwijk, The Netherlands. During this period he developed an instrument to assess the water/ice content, and to perform stratigraphic studies as well, of the Martian regolith.

2005-2007 ⇒ PhD (2006-2007) in Space Physics at *Université Pierre et Marie Curie* (Paris 6), Paris, France, and research activity (2005-2007) in Planetary and Space Science at *Centre d'Etude des Environnements Terrestre et Planétaires* (CETP), Saint Maur, France.

2008-2009 ⇒ Postdoc in Ionospheric and Space Plasma Physics at *Laboratoire ATmosphères, Milieux, Observations Spatiales* (LATMOS), Saint Maur, France.

2009-2012 ⇒ Postdoc in the Heliophysics Science Division, Space Weather Laboratory (code 674) in the National Aeronautics and Space Administration, Goddard Space Flight Center (NASA/GSFC), Greenbelt, Maryland, USA, where he worked on data analysis of the Communications/Navigation Outage Forecasting System (C/NOFS) satellite.

2013-present ⇒ Head of research and development at Active Space Technologies.

2018-present ⇒ Business development and scale up activities at Active Aerogels.

- Research Interests

His research interests cover a variety of theoretical and experimental subjects related to space science. In the most recent years, he has developed analytical and numerical models to study planetary atmospheric electricity and wave propagation, namely Schumann resonances. He also dedicates time to space instrumentation, mainly electric sensors to study low frequency electromagnetic wave propagation, and mutual impedance probes to detect water/ice and perform stratigraphic investigations of the surface and subsurface of planetary environments. Currently, his major research studies are devoted to atmospheric electricity on Earth, Mars, and Titan, namely low frequency wave propagation in the ionosphere and its significance for the investigation of troposphere-ionosphere coupling mechanisms. His contribution is recognized by experts in the fields of space weather and the Sun-Earth connection.

- Technology Interests

To earn his BSc degree, between 1991 and 1992, Fernando built a Nd:YAG pulsed laser (energy: 150 mJ; pulse duration: 10 ns; repetition rate: 20 s⁻¹) for range finding applications. For this work, he received a Young Scientist Award from the Portuguese Science and Technology Foundation (FCT).

From April 2002 to September 2004 he joined the Research and Scientific Support Department (RSSD) - Planetary Missions Division, ESA-ESTEC, where he worked in water/ice detection techniques, especially suited for the Martian environment. His experimental work covered the project, development, and construction of quadrupolar probes for the detection of water and ice, and for stratigraphic analysis. His work was awarded during the 4th International Planetary Probe Workshop held in Pasadena, California, 2006, a prize attributed jointly by NASA and ESA to scientific instrumentation innovative concepts.

He participated in the calibration of *Philae*, the *Rosetta* lander, especially the permittivity probe instrument (SESAME-PP) onboard the Rosetta mission.

He was involved in data analysis of the *Huygens Probe*, mainly the Permittivity, Wave, and Altimetry (PWA) analyzer, a subsystem of the Huygens Atmospheric Structure Instrument (HASI) onboard the Cassini-Huygens mission.

He participated in several experiments related to atmospheric electricity and tropospheric weather investigations, employing stratospheric balloon measurements, namely the Africa Monsoon Multidisciplinary Analyses (AMMA) campaign (Niger, 2006).

He analyzed data from the C/NOFS (Communications/Navigation Outage Forecasting System) mission, mainly the VEFI (Vector Electric Field Instrument) sensor.

He has worked in 3D additive manufacturing in titanium, development of electronics from harsh environments in aeronautics.

More recently, concerning aerogel technology, he has been investigating scale-up applications and developing technologies for space missions, namely thermal insulation and multipaction phenomena prevention (patent pending).

- Theoretical and Modeling Skills

During the master degree, he dedicated to the study of strong magnetic fields of the surface of neutron stars, namely of the atomic and molecular properties in such exotic conditions. He has used both non relativistic and relativistic quantum approximations, including Schrödinger, Klein-Gordon, and Dirac equations to calculate atomic and molecular energy levels in strong magnetic fields ($B > 10^8$ T).

In October 2004 he joined the *Centre d'Etudes Terrestres et Planétaires* (CETP), Paris, France, a CNRS/CNES associated laboratory, and worked for the Cassini-Huygens mission. He did calibration and data analysis of PWA, the atmospheric electricity analyzer.

He is currently studying electromagnetic wave propagation in the surface-ionosphere cavity of planetary environments (from Venus to Neptune, and a few moons as well). Recently, Fernando has published mainly in subjects related to Schumann resonance theory and applications, combining both data analysis and modeling.

- Information Technology

Knowledge of IDL, Matlab, and Visual Basic. He has experience with C, Pascal, and Fortran. Specifically, he uses Matlab at a professional level for signal processing, data analysis, and data acquisition applications. He often uses the finite element tools for solving a wide range of physical problems, namely electrostatics, heat transfer, electromagnetics, magnetohydrodynamics, structural mechanics, fluid dynamics, and quantum mechanics.

- Linguistics Proficiency

His mother tongue is Portuguese and also speaks English, French, Spanish, and Italian.

- Publications and Conferences

He is co-author of many refereed papers in scientific journals, holds a few international patents, publishes frequently in proceedings, and has participated in many conferences and scientific meetings. The most important publications are listed below. He is a referee of the following journals: *Advances in Space Research*, *Annales Geophysicae*, *Icarus*, *Journal of Geophysical Research - Planets*, *Journal of Geophysical Research - Space Science*, *Meteoritics and Planetary Science*, and *Planetary and Space Science*. His current Hirsch number (h-index) is 16.

Patents:

F. Simões, A. Pereira, D. Tchepel, B. Barbosa, R. Catarrinho, M. Galinha (2020). *Automated guided vehicle for decontamination and disinfection of harmful environments*, 20202001121187 (pending).

F. Simões, R. Santos, J. Pereira, M. Ribeiro, M. Galinha (2020). *Recursive method to calculate statistical moments, covariance, and correlation in data acquisition and analysis*, 20202001121187 (pending).

F. Simões, M. Ochoa, G. Goussetis, M.A. Kunes, V.E. Boria-Esbert (2020). *Method for minimizing the multipactor effect in waveguides and resonant cavities*, 20202001130604 (pending).

F. Simões, A. Mendes, I. Ribeiro, T. Marques, J. Varandas (2013). *Method and system for monitoring ablation processes in thermal protection systems* (IPC: B64G1/66; G01N27/20) – PT107152(A).

A. Mendes, **F. Simões** (2013). *Method and system for monitoring electrical wire aging* (IPC: G01R31/28) – PT106994(A), WO2014200375(A1).

B. Carvalho, **F. Simões**, R. Patrício (2003). *Autonomous garment with active thermal control and powered by solar cells* (IPC: A41D13/005; A41D1/00) – AT395840(T), AU2004279277(A1/B2), CA2543468(A1/C), DK1679984(T3), EP1679984(A1/B1/B8), ES2308243(T3), JP2007509244(A), JP4708355(B2), KR20060123738(A), KR101126392(B1), NO2006221(A), NO328018(B1), PT103030(A), US20040576198 , US2007199137(A1), WO2005034662(A1).

R. Vilar, **F. Simões**, N. Braz (2002). *Automatic system for monitoring tailored blanks* (IPC: F16P3/00; F16P3/14; F16P3/00) – PT9725(U/T).

R. Vilar, **F. Simões**, L. Costa, A. Utkin, A. Lavrov (2001). *Lidar system controlled by computer applied, in particular, to early stage forest fire detection* (IPC: G01S1/00; G01S7/48; G01S17/95) – AU2008200979, AU2002311703(A1), BR0210103(A), EP1446681(A1), IL159115(A), PT102617(A/B), RU2293998(C2), US2004239912(A1), US7164468(B2), WO2002PT00010, WO03073128(A1).

F. Simões, J. Coelho, J. Rabaça (1996). *Method for colouring pieces of rock by laser rays*, (IPC: C04B41/00; B44C5/06) – AT195500(B/T), AU693485(B2), AU7951194(A), BR9408421(A), CA19942179780, CA2179780 (A1), CN1046691(C), CN1139423(A), DE69425586(T2), EP0735989(A1/B1), ES2152333(T3), JPH09507468(A), US19960676117, US19970931004, US6037015(A,X6), WO1994PT00011, WO9612684(A1).

Peer reviewed articles:

A. Lethuillier, A. Le Gall, M. Hamelin, S. Caujolle-Bert, F. Schreiber, N. Carrasco, G. Cernogora, C. Szopa, Y. Brouet, **F. Simões**, J.J. Correia, G. Ruffié (2018). *Electrical Properties of Tholins and Derived Constraints on the Huygens Landing Site Composition at the Surface of Titan*. *Journal of Geophysical Research – Planets*, 123, 807-822, doi: 10.1002/2017JE005416 [cited 1 times].

F. Esposito, S. Debei, C. Bettanini, C. Molfese, I. Arruego Rodriguez, G. Colombatti, A.M. Harri, F. Montmessin, C. Wilson, A. Aboudan, S. Abbaki, V. Apestigue, G. Bellucci, J.J. Berthelier, J.R. Brucato, S.B. Calcutt, F. Cortecchia, F. Cucciarrè, G. Di Achille, F. Ferri, F. Forget, E. Friso, M. Genzer, H. Haukka, J.J. Jimenez, S. Jimenez, J.L. Josset, O. Karatekin, G. Landis, R. Lorenz, E. Marchetti, J. Martinez, L. Marty, V. Mennella, D. Möhlmann, D. Moirin, R. Molinaro, E. Palomba, M. Patel, J.P. Pommereau, C.I. Popa, S. Rafkin, P. Rannau, N.O. Renno, P. Schipani, W. Schmidt, E. Segato, S. Silvestro, **F. Simões**, A. Spiga, F. Valero, L. Vázquez, F. Vivat, O. Witasse, P. Mugnuolo, S. Pirrotta (2014). *The DREAMS experiment of the ExoMars 2016 mission for the study of Martian environment during the dust storm season*, Eighth International Conference on Mars, held July 14-18, 2014 in Pasadena, California. LPI Contribution No. 1791, p.1246 [cited 13 times].

C. Bettanini, F. Esposito, S. Debei, C. Molfese, I.A. Rodriguez, G. Colombatti, A.M. Harri, F. Montmessin, C. Wilson, A. Aboudan, S. Abbaki, V. Apestigue, G. Bellucci, J.J. Berthelier, J.R. Brucato, S.B. Calcutt, F. Cortecchia, G. Di Achille, F. Ferri, F. Forget, G.P. Guizzo, E. Friso, M. Genzer, P. Gilbert, H. Haukka, J.J. Jimenez, S. Jimenez, J.L. Josset, O. Karatekin, G. Landis, R. Lorenz, J. Martinez, M.V. Mennella, D. Möhlmann, D. Moirin, R. Molinaro, E. Palomba, M. Patel, J.P. Pommereau, C.I. Popa, S. Rafkin, P. Rannou, N.O. Renno, P. Schipani, W. Schmidt, S. Silvestro, **F. Simões**, A. Spiga, F. Valero, L. Vázquez, F. Vivat, O. Witasse, R.

Mugnuolo, S. Pirrotta, E. Marchetti (2014). *The DREAMS experiment on the ExoMars 2016 mission for the study of Martian environment during the dust storm season*. IEEE International Workshop on Metrology for Aerospace, IEEE Instrumentat & Measurement Soc., 167-173, doi: 10.1109/MetroAeroSpace.2014.6865914 [cited 4 times].

F. Simões, R. Pfaff, H. Freudenreich, J. Klenzing, D. Rowland, K. Bromund, L. Kepko, G. Le, M. C. Liebrecht, S. Martin, P. Uribe (2014). *Equatorial ionosphere semiannual oscillation investigated from low frequency electromagnetic wave propagation*. Journal of Geophysical Research – Atmospheres, 118, 12,045-12,051, doi: 10.1002/jgrd.50797 [cited 1 times].

J. Klenzing, A.G. Burrell, R.A. Heelis, J. Huba, R. Pfaff, **F. Simões** (2013). *Exploring the role of ionospheric drivers during the extreme solar minimum of 2008*, Annales Geophysicae, 31, 2147-2156 [cited 10 times].

J. Klenzing, **F. Simões**, S. Ivanov, D. Bilitza, R.A. Heelis, D. Rowland (2013). *Performance of the IRI-2007 model for equatorial topside ion density in the African sector for low and extremely low solar activity*, Advances in Space Research, 52, 1780-1790, doi: 10.1016/j.asr.2012.09.030 [cited 12 times].

F. Simões, J. Klenzing, S. Ivanov, S., R. Pfaff, H. Freudenreich, D. Bilitza, D. Rowland, K. Bromund, M.C. Liebrecht, S. Martin, P. Schuck, P. Uribe, T. Yokoyama (2012). *Detection of ionospheric Alfvén resonator signatures in the equatorial ionosphere*. Journal of Geophysical Research - Space Physics, 117, A11305, doi:10.1029/2012JA017709 [cited 14 times].

F. Simões, R. Pfaff, M. Hamelin, J. Klenzing, H. Freudenreich, C. Béghin, J.-J. Berthelier, K. Bromund, R. Grard, J.-P. Lebreton, S. Martin, D. Rowland, D. Sentman, Y. Takahashi, Y. Yair (2012). *Using Schumann resonance measurements for constraining the water abundance on the giant planets – implications for the Solar System formation*. The Astrophysical Journal, 750: 85 (14pp), doi:10.1088/0004-637X/750/1/85 [cited 9 times].

C. Béghin, O. Randriamboarison, M. Hamelin, E. Karkoschka, C. Sotin, R.C. Whitten, J.-J. Berthelier, R. Grard, **F. Simões** (2012). *Analytic theory of Titan's Schumann resonance: constraints on ionospheric conductivity and buried water ocean*, Icarus 218, 1028-1042, doi: 10.1016/j.icarus.2012.02.005 [cited 53 times].

J. Klenzing, **F. Simões**, S. Ivanov, R.A. Heelis, D. Bilitza, R. Pfaff, D. Rowland (2011). *Topside equatorial ionospheric density and composition during and after extreme solar minimum*. Journal of Geophysical Research - Space Physics, 116, A12330, doi:10.1029/2011JA017213 [cited 31 times].

F. Simões, R.F. Pfaff, H. Freudenreich (2011). *Satellite observations of Schumann resonances in the Earth's ionosphere*. Geophysical Research Letters, 38, L22101, doi:10.1029/2011GL049668 [cited 31 times].

R. Grard, S. Berthelin, C. Béghin, M. Hamelin, J.-J. Berthelier, J.J. López-Moreno, **F. Simões** (2011). *Comment on "An analysis of VLF electric field spectra measured in Titan's atmosphere by the Huygens probe" by J. A. Morente et al.* Journal of Geophysical Research - Planets, 116, E05005, doi: 10.1029/2009JE003555 [cited 2 times].

G.J. Molina-Cuberos, R. Godard, J.-J. López-Moreno, M. Hamelin, R. Grard, **F. Simões**, K. Schwingenschuh, V.J.G. Brown, P. Falkner, F. Ferri, I. Jernej, J.M. Jerónimo, R. Rodrigo, R. Trautner, M.J. Núñez, N. Ibrahim, C. Groth, M. Fulchignoni (2010). *A new approach for estimating Titan's electron conductivity based on data from relaxation probe sensors on the Huygens experiment*, Planetary and Space Science 58, 1945-1952 [cited 5 times].

F. Cairo, J.P. Pommereau, K.S. Law, H. Schlager, A. Garnier, F. Fierli, M. Ern, M. Streibel, S. Arabas, S. Borrmann, J.-J. Berthelier, C. Blom, T. Christensen, F. D'Amato, G. Di Donfrancesco, T. Deshler, A. Diedhiou, G. Durrý, O. Engelsen, F. Goutail, N.R.P. Harris, E.R.T. Kerstel, S. Khaykin, P. Konopka, A. Kylling, N. Larsen, T. Lebel, X. Liu, A.R. MacKenzie, J. Nielsen, A. Oulanowski, D.J. Parker, J. Pelon, J. Polcher, J.A. Pyle, F. Ravegnani, E.D. Rivière, A.D. Robinson, T. Röckmann, C. Schiller, **F. Simões**, L. Stefanutti, F. Stroh, L. Some, P. Siegmund, N. Sitnikov, J.P. Vernier, C.M. Volk, C. Voigt, M. von Hobe, S. Viciani, V. Yushkov (2010). *An introduction to the SCOUT-AMMA stratospheric aircraft, balloons and sondes campaign in West Africa, August 2006: rationale and roadmap*. Atmospheric Chemistry and Physics 10, 2237-2256 [cited 34 times].

F. Cairo, J.P. Pommereau, K.S. Law, H. Schlager, A. Garnier, F. Fierli, M. Ern, M. Streibel, S. Arabas, S. Borrmann, J.-J. Berthelier, C. Blom, T. Christensen, F. D'Amato, G. Di Donfrancesco, T. Deshler, A. Diedhiou, G. Durrý, O. Engelsen, F. Goutail, N.R.P. Harris, E.R.T. Kerstel, S. Khaykin, P. Konopka, A. Kylling, N. Larsen, T. Lebel, X. Liu, A.R. MacKenzie, J. Nielsen, A. Oulanowski, D.J. Parker, J. Pelon, J. Polcher, J.A. Pyle, F. Ravegnani, E.D. Rivière, A.D. Robinson, T. Röckmann, C. Schiller, **F. Simões**, L. Stefanutti, F. Stroh, L. Some, P. Siegmund, N. Sitnikov, J.P. Vernier, C.M. Volk, C. Voigt, M. von Hobe, S. Viciani, V. Yushkov (2009).

An introduction to the SCOUT-AMMA stratospheric aircraft, balloons and sondes campaign in West Africa, August 2006: rationale, roadmap and highlights. Atmospheric Chemistry and Physics Discussions 9, 19713-19781 [cited 2 times].

F. Simões, J.-J. Berthelier, M. Godefroy, S. Yahi (2009). *Observation and modeling of the Earth-ionosphere cavity electromagnetic transverse resonance and variation of the D-region electron density near sunset*, Geophysical Research Letters, 36, L14816, doi:10.1029/2009GL039286 [cited 7 times].

M. Hamelin, R. Grard, J.J. López-Moreno, K. Schwingenschuh, C. Béghin, J.J. Berthelier, **F. Simões** (2009). *Comment on "Evidence of electrical activity on Titan drawn from the Schumann resonances sent by Huygens probe" by J.A. Morente, J.A. Portí, A. Salinas, E.A. Navarro [2008, Icarus, doi: 10.1016/j.icarus.2008.02.004]*. Icarus 204, 349-351 [cited 4 times].

C. Béghin, P. Canu, E. Karkoschka, C. Sotin, C. Bertucci, W.S. Kurth, J.J. Berthelier, R. Grard, M. Hamelin, K. Schwingenschuh, **F. Simões** (2009). *New insights on Titan's plasma-driven Schumann resonance inferred from Huygens and Cassini data*. Planetary and Space Science 57, 1872-1888 [cited 32 times].

F. Simões, M. Hamelin, R. Grard, K.L. Aplin, C. Béghin, J.-J. Berthelier, B.P. Besser, J.-P. Lebreton, J.J. López-Moreno, G.J. Molina-Cuberos, K. Schwingenschuh, T. Tokano (2008). *Electromagnetic wave propagation in the surface-ionosphere cavity of Venus*. Journal of Geophysical Research 113, E7, E07007, doi: 10.1029/2007JE003045 [cited 12 times].

F. Simões, R. Grard, M. Hamelin, J.J. López-Moreno, K. Schwingenschuh, C. Béghin, J.-J. Berthelier, J.-P. Lebreton, G.J. Molina-Cuberos, T. Tokano (2008). *The Schumann resonance: a tool for exploring the atmospheric environment and the subsurface of the planets and their satellites*. Icarus 194, 30-41 [cited 18 times].

J.J. López-Moreno, G.J. Molina-Cuberos, M. Hamelin, R. Grard, **F. Simões**, R. Godard, K. Schwingenschuh, C. Béghin, J.-J. Berthelier, V.J.G. Brown, P. Falkner, F. Ferri, M. Fulchignoni, I. Jernej, J.M. Jerónimo, R. Rodrigo, R. Trautner (2008). *Structure of Titan's low altitude ionized layer from the Relaxation Probe onboard Huygens*. Geophysical Research Letters 35, L22104, doi:10.1029/2008GL035338 [cited 31 times].

O. Witasse, L. Huber, J. Zender, J.-P. Lebreton, R. Beebe, D. Heather, D.L. Matson, J. Zarnecki, J. Wheadon, R. Trautner, M. Tomasko, P.L. Stoppato, **F. Simões**, C. See, M. Perez-Ayucar, C. Pennanech, H. Niemann, L. McFarlane, M. Leese, B. Kazeminejad, G. Israel, B. Hathi, A. Hagermann, J. Haberman, M. Fulchignoni, F. Ferri, R. Dutta-Roy, L. Doose, J. Demick-Montelara, G. Colombatti, J.-F. Brun, M. Bird, D. Atkinson, A. Aboudan (2008). *The Huygens scientific data archive: Technical overview*. Planetary and Space Science 56, 770-777 [cited 5 times].

F. Simões, R. Grard, M. Hamelin, J.J. López-Moreno, K. Schwingenschuh, C. Béghin, J.-J. Berthelier, B. Besser, V.J.G. Brown, M. Chabassière, P. Falkner, F. Ferri, M. Fulchignoni, R. Hofe, I. Jernej, J.M. Jeronimo, G.J. Molina-Cuberos, R. Rodrigo, H. Svedhem, T. Tokano, R. Trautner (2007). *A new numerical model for the simulation of ELF wave propagation and the computation of eigenmodes in the atmosphere of Titan: did Huygens observe any Schumann resonance?* Planetary and Space Science 55, 1978-1989 [cited 32 times].

C. Béghin, **F. Simões**, V. Karsnoselskikh, K. Schwingenschuh, J.J. Berthelier, B. Besser, C. Bettanini, R. Grard, M. Hamelin, J.J. López-Moreno, G.J. Molina-Cuberos, T. Tokano (2007). *A Schumann-like resonance on Titan driven by Saturn's magnetosphere possibly revealed by the Huygens probe*. Icarus 191, 251-266 [cited 36 times].

M. Hamelin, C. Béghin, R. Grard, J.J. López-Moreno, K. Schwingenschuh, **F. Simões**, R. Trautner, J.J. Berthelier, V.J.G. Brown, M. Chabassière, P. Falkner, F. Ferri, M. Fulchignoni, I. Jernej, J.M. Jeronimo, G.J. Molina-Cuberos, R. Rodrigo, T. Tokano (2007). *Conductivity and electron density profiles of the atmosphere of Titan from the Huygens PWA-HASI instrument: Mutual Impedance Probe measurements*. Planetary and Space Science 55, 1964-1977 [cited 39 times].

R. Grard, M. Hamelin, J.J. López-Moreno, K. Schwingenschuh, I. Jernej, G.J. Molina-Cuberos, **F. Simões**, R. Trautner, P. Falkner, F. Ferri, M. Fulchignoni, R. Rodrigo, H. Svedhem, C. Béghin, J.-J. Berthelier, V.J.G. Brown, M. Chabassière, J.M. Jeronimo, L.M. Lara, T. Tokano (2006). *Electric properties and related physical characteristics of the atmosphere and surface of Titan*. Planetary and Space Science 54, 1124-1136 [cited 40 times].

M. Fulchignoni, F. Ferri, F. Angrilli, A. J. Ball, A. Bar-Nun, M. A. Barucci, C. Bettanini, G. Bianchini, W. Borucki, G. Colombatti, M. Coradini, A. Coustenis, S. Debei, P. Falkner, G. Fanti, E. Flamini, V. Gaborit, R. Grard, M. Hamelin, A. M. Harri, B. Hathi, I. Jernej, M. R. Leese, A. Lehto, P. F. Lion Stoppato, J. J. López-Moreno, T. Makinen, J. A. M. McDonnell, C. P. McKay, G. Molina-Cuberos, F. M. Neubauer, V. Pirronello,

R. Rodrigo, B. Saggin, K. Schwingenschuh, A. Seiff, **F. Simões**, H. Svedhem, T. Tokano, M. C. Towner, R. Trautner, P. Withers, J. C. Zarnecki (2005). *In situ measurements of the physical characteristics of Titan's environment*. Nature 438, 785-791 [cited 469 times].

V. Oliveira, **F. Simões**, R. Vilar (2005). *Column-growth mechanisms during KrF laser micromachining of Al₂O₃ TiC ceramics*. Applied Physics A, 81, 6, 1157-1162, DOI: 10.1007/s00339-004-3083-2 [cited 13 times].

V. Oliveira, **F. Simões**, R. Vilar (2005). *Column growth mechanisms during KrF laser micromachining of Al₂O₃-TiC*. SPIE Micromachining and Microfabrication Process Technology, 5715, 101-109 [cited 1 times].

A. Utkin, A. Fernandes, **F. Simões**, A. Lavrov, R. Vilar (2003). *Feasibility of forest-fire smoke detection using lidar*. International Journal of Wildland Fire 12 (2), 159-166, DOI: 10.1071/WF02048 [cited 25 times].

A. Utkin, A. Lavrov, L. Costa, **F. Simões**, R. Vilar (2002). *Detection of small forest fires by lidar*. Applied Physics B, A74, 77-83, DOI: 10.1007/s003400100772 [cited 58 times].

Peer reviewed articles in books:

F. Simões, R.F. Pfaff, J.-J. Berthelier, J. Klenzing (2011). *A review of low frequency electromagnetic wave phenomena related to tropospheric-ionospheric coupling mechanisms*. Space Science Reviews, 168, 551-593, doi: 10.1007/s11214-011-9854-0 [cited 23 times].

F. Simões, M. Rycroft, N. Renno, Y. Yair, K.L. Aplin, Y. Takahashi (2008). *Schumann resonances as a means of investigating the electromagnetic environment in the Solar System*. Space Science Reviews, 137, 455-471, DOI: 10.1007/s11214-008-9398-0 and reprinted in Planetary Atmospheric Electricity, ISBN: 978-0-387-87663-4 [cited 17 times].

Y. Yair, G. Fischer, **F. Simões**, N. Renno, P. Zarka (2008). *Updated review of planetary atmospheric electricity*. Space Science Reviews 137, 29-49 DOI: 10.1007/s11214-008-9349-9 and reprinted in Planetary Atmospheric Electricity, ISBN: 978-0-387-87663-4 [cited 31 times].

F. Simões, A.A. da Costa (1998). *Pulsar electrodynamics: atoms in strong magnetic fields*. NATO-ASI series: The Many Faces of Neutron Stars pp. 269-275. Editors R. Buccheri, J. van Paradijs, and M.A. Alpar, Kluwer Academic Publishers, Dordrecht, Netherlands [cited 1 times].

Selection among the most relevant proceedings:

Bettanini, C., Esposito, F., Debei, S., Molfese, C., Rodriguez, I.A., Colombatti, G., Harri, A.M., Montmessin, F., Wilson, C., Aboudan, A., Abbaki, S., Apestigue, V., Bellucci, G., Berthelier, J.J., Brucato, J.R., Calcutt, S.B., Cortecchia, F., Di Achille, G., Ferri, F., Forget, F., Guizzo, G.P., Friso, E., Genzer, M., Gilbert, P., Haukka, H., Jimenez, J.J., Jimenez, S., Josset, J.L., Karatekin, O., Landis, G., Lorenz, R., Martinez, J., Mennella, M.V., Mohlmann, D., Moirin, D., Molinaro, R., Palomba, E., Patell, M., Pommereau, J.P., Popa, C.I., Rafkin, S., Rannou, P., Renno, N.O., Schipani, P., Schmidt, W., Silvestro, S., **Simões, F.**, Spiga, A., Valero, F., Vazquez, L., Vivat, F., Witasse, O., Mugnuolo, R., Pirrotta, S., Marchetti, E. (2014). *The DREAMS experiment on the ExoMars 2016 mission for the study of Martian environment during the dust storm season*, IEEE International Workshop on Metrology for Aerospace (Metroaerospace), 167-173, ISBN:978-1-4799-2069-3.

F. Simões, J.-J. Berthelier, R. Pfaff, D. Bilitza, J. Klenzing (2011). *Monitoring D-region variability from lightning measurements*. General Assembly and Scientific Symposium, 2011 XXXth URSI, pp.1-4, 13-20 Aug. 2011, doi: 10.1109/URSIGASS.2011.6050887.

F. Simões, M. Hamelin (2006). *Low frequency electromagnetic wave propagation in large cavities: a tool for investigating planetary electric environments. Study of the cavity of Titan after the Cassini-Huygens mission*. Proceedings of Comsol Multiphysics Conference 2006, 23-29, Paris, France.

F. Simões, V. Brown, M. Chabassière, P. Falkner, F. Ferri, M. Fulchignoni, R. Grard, M. Hamelin, R. Hofe, I. Jernej, L. Lara, J.J. López-Moreno, G. Molina-Cuberos, R. Rodrigo, K. Schwingenschuh, R. Trautner (2005).

Calibrating electric instruments of the Huygens Probe and modelling the dielectric properties of the atmosphere and of the surface of Titan. Proceedings of Comsol Multiphysics Conference 2005, 247-250, Paris, France.

V. Oliveira, **F. Simões**, R. Vilar (2005). *Column growth mechanisms during KrF laser micromachining of Al₂O₃-TiC.* Proceedings of the Society of Photographic Instrumentation Engineers, 5715, 101-109, DOI: 10.1117/12.591944.

F. Simões, R. Trautner, R. Grard, M. Hamelin (2004). *Laboratory measurements on Martian soil simulant JSC Mars-1: supporting the calibration of instruments for planetary missions.* The 37th ESLAB Symposium in Tools and Technologies for Future Planetary Exploration, edited by B. Battrick, ESA SP-543, 205-209.

R. Trautner, **F. Simões**, R. Grard, M. Hamelin (2004). *A new instrument for measuring the low-frequency electrical properties of planetary subsurface materials,* The 37th ESLAB Symposium in Tools and Technologies for Future Planetary Exploration, edited by B. Battrick, ESA SP-543, 193-196.

M. Hamelin, R. Grard, H. Laakso, R. Ney, W. Schmidt, **F. Simões**, R. Trautner (2004). *Conductivity and dielectric characteristics of planetary surfaces deduced by Mutual Impedance Probes: from Huygens and Rosetta Lander to Netlanders and future missions to solid planetary bodies.* The 37th ESLAB Symposium in Tools and Technologies for Future Planetary Exploration, edited by B. Battrick, ESA SP-543, 169-174, Noordwijk, The Netherlands.

F. Simões, R. Trautner, R. Grard, M. Hamelin (2004). *The dielectric properties of Martian soil simulant JSC Mars-1 in the frequency range from 20 Hz to 10 kHz,* 35 LPSC, Houston.

R. Grard, R. Trautner, **F. Simões** (2003). *The search for water under the surface of Mars,* in ESA Space Science News, Newsletter 5, 7-8, ESTEC, The Netherlands.

R. Trautner, **F. Simões** (2002). *Detection and characterization of ice and water deposits on Mars by means of mutual impedance probes on surface and subsurface vehicles,* Proceedings of the Second European Workshop on Exo-Astrobiology, ESA SP-518, Graz, Austria, 319-322.

A. Utkin, A. Fernandes, **F. Simões**, R. Vilar, A. Lavrov (2002). *Forest-fire detection by means of lidar,* Proceedings of IV International Conference on Forest Fire Research, Luso, Coimbra, Portugal, November 18-23, 2002. Edited by D. Xavier Viegas, MillPress, Rotterdam, Netherlands, 58.

F. Simões, A.A. da Costa (1998). *Pulsar electrodynamics: atoms in strong magnetic fields,* Proceedings of the NATO-ASI "The Many Faces of Neutron Stars", Lipari, Italy, ed. R. Buccheri, J. van Paradijs, and M. A. Alpar, Kluwer Academic Publishers, Dordrecht, Netherlands, 269-275.

F. Simões, A.A. da Costa (1995). *Neutron star surfaces: atoms in strong magnetic fields – a non relativistic approach,* in European Pulsar Network, Manchester, U. K., 158-163.

Coimbra, 1 November 2020

(Fernando Simões)