João de Teixeira da Encarnação

Postdoctoral Fellow, Center for Space Research, University of Texas at Austin

Personal Information

Full Name:	João Gregório de Teixeira da Encarnação
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Education

2015 **PhD in Space Geodesy**
GRS[10], TU Delft[11]
Dissertation: *Next-generation satellite gravimetry for measuring mass transport in the Earth system* [12]
Promotor: Prof. Dr-Ing. habil. Roland Klees [13]
Supervisor: Dr. Ir. Pavel Ditmar [14]

[1] directory.utexas.edu/index.php?q=joao+encarnacao
[2] nl.linkedin.com/in/joaoencarnacao
[3] www.researchgate.net/profile/Joao_Encarnacao2
[4] scholar.google.com/citations?user=k2liFwQAAAAJ
[5] orcid.org/0000-0001-6824-2733
[6] www.mendeley.com/profiles/joao-encarnacao4/
[7] www.scopus.com/authid/detail.uri?authorId=15135565900
[8] publons.com/a/782170/
[9] github.com/jgte
[10] Geoscience and Remote Sensing, www.tudelft.nl/en/ceg/over-faculteit/departments/geoscience-remote-sensing/
[11] Delft University of Technology, www.tudelft.nl
[12] tinyurl.com/SatGrav
[13] www.tudelft.nl/en/ceg/over-faculteit/departments/geoscience-remote-sensing/staff/scientific-staff/profdr-ing-habil-r-roland-klees/
[14] www.tudelft.nl/citg/over-faculteit/afdelingen/geoscience-remote-sensing/staff/scientific-staff/dr-pg-pavel-ditmar/

2004 **Master of Sciences in Aerospace Engineering**
AS[15], TU Delft
Final Thesis: *Numerical Simulation of Launch Vehicles*
Supervisor: Prof. Ir. B.A.C. Ambrosius [16]

2000 **Licenciate[17] in Aerospace Engineering**
IST[18], UTL[19]
5^{th} year concluded at TU Delft, through the ERASMUS program [20]
Report: *Optimum Aerodynamic Shape for a High Altitude Long Endurance Aerostatic Platform*
Supervisor: Prof. Dr. Ir. Theo van Holten

Academic and Research Experience

Aug. 2016 – present **Research Associate** at CSR[21], UTexas[22], USA:

- Improvements in the calibration of the accelerometers on-board the GRACE[23] satellites, in particular in what relates to temperature effects;
- Determination of the (non-linear) long-term trends in the GRACE gravity field solutions and their prediction during the GRACE/GRACE-FO[24] gap;
- Time-varying gravity fields estimated from Kinematic Orbits;
- In-house software development in Matlab and Ruby.

[15] Astrodynamics and Space missions, www.as.lr.tudelft.nl/
[16] www.tudelft.nl/en/staff/b.a.c.ambrosius
[17] Licenciatura, en.wikipedia.org/wiki/Licentiate
[18] Instituto Superior Técnico, tecnico.ulisboa.pt
[19] Technical University of Lisbon, www.ulisboa.pt/en
[20] www.erasmusprogramme.com
[21] Center for Space Research, www.csr.utexas.edu
[22] University of Texas at Austin, www.utexas.edu
[23] Gravity Recovery And Climate Experiment
[24] GRACE Follow On

Sep. 2011 – Jul. 2016 **Research Associate** at AS, TU Delft, the Netherlands:

- Calibration of the accelerometers on-board the Swarm satellites;
- Improvements in the modelling of non-conservative forces acting on satellites;
- Exploiting DSP[25] techniques to merge the measurement of non-gravitational accelerations from different sources: GPS[26]-driven and accelerometer observations;
- Time-varying gravity fields estimated from Kinematic Orbits;
- Research project: Assessment of Satellite Constellations for Monitoring the Variations in Earth's Gravity Field;
- Research project: GOCE+ Theme3: Air density and wind retrieval using GOCE[27] data;
- Research project: Development of the Swarm Level 2 Algorithms and Associated Level 2 Processing Facility;
- In-house software development in Fortran, Matlab and Ruby;
- Student supervision and mentoring.

Jan. 2007 – Dec. 2015 **PhD Candidate** at GRS, TU Delft, the Netherlands:

- Simulation of future gravimetric satellite missions and noise budget of low-low satellite-to-satellite tracking gravimetric data;
- Impact of orbit position modelling errors in the quality of satellite gravimetric data;
- Retrieval of the high-frequency time-variable gravity field of the Earth with numerous satellites;
- Research project: Assessment of a Next Generation Gravity Mission for Monitoring the Variations of Earth's Gravity Field;
- Research project: Monitoring and Modelling Individual Sources of Mass Distribution and Transport in the Earth System by Means of Satellites;
- In-house software development in Fortran and Matlab;
- Student supervision and mentoring.

[25] Digital Signal Processing
[26] Global Positioning System
[27] Gravity field and steady-state Ocean Circulation Explorer

Apr. 2005 – Nov. 2006 **Stress Engineer** at Global Technics [28], Leiden, the Netherlands:
- Automated design (for weight and stress minimization) of fuselage panels for the Airbus A380 aircraft (in-house implementation of a tool in C++);
- Trainees supervision and mentoring.

Oct. 2004 – Jan. 2005 **Aerospace Engineer** at Delta-Utec [29], Leiden, the Netherlands:
- Contractor Work: Implementation of a Sub-Orbital Optimization Module into the Simulation Tool *COLVET* (developed in-house at TU Delft).

Mar. 2004 – Apr. 2004 **Trainee** at the Prins Maurits Laboratorium, TNO [30], the Netherlands
Supervisor: Ir. Berry Sanders, Rocket Technology Research Group:
- Implementation of the Launch Vehicle Simulation and Optimisation Tool *COLVET*;
- Numerical Simulations on Laser Propulsion (appendix of MSc thesis);
- Collaboration with international colleagues (PT and NL) on a ESA[31]-funded project to determine the feasibility of Laser Propulsion.

Sep. 2001 – Dec. 2001 **Trainee** at ESTEC[32], ESA, Noordwijk, the Netherlands
Supervisor: Prof. Wubbo Ockels [33]:
- Collaboration with fellow MSc colleagues on a space mission design project: *Lunar Exploration with Ariane 5*;
- Simulation of rocket ascent trajectories (implemented a 2D orbit integrator in Matlab);
- Optimization or rocket trajectories, thrust and attitude program, fuel consumption and payload;
- Preliminary lunar mission design.

Teaching Experience

At TU Delft, I was required to supervise student projects of a practical nature, every year. This means that I had to direct the work of a small group of students (7 to 9) to a particular

[28] www.globaltechnics.nl/
[29] www.delta-utec.com/
[30] www.tno.nl/
[31] European Space Agency, www.esa.int
[32] European Space Research and Technology Centre, www.esa.int/About_Us/ESTEC
[33] en.wikipedia.org/wiki/Wubbo_Ockels

objective. It is an activity I enjoy doing and I see the students are enthusiastic about. I always ask them to fill (anonymously) a short list of questions regarding their opinion of the project and my ability as instructor (these answer sheets are available if requested). I always get encouraging and positive feedback.

My senior colleagues always grade my teaching activities as very good to excellent and I am often asked by students to support their application with recommendation letters.

In what concerns teaching large groups of students, I have given lectures to classes of about 30 students, on exceptional occasions, at the request of colleagues.

Additionally, I was a lecturer at the 2017 Summer School On Data Assimilation And Its Applications In Oceanography, Hydrology, Risk & Safety And Reservoir Engineering (cf. data-assimilation.com [34]).

I value all teaching my experiences because they were extremely rewarding.

Skills

Communication:	Numerous presentations of research results (8 oral and 4 poster)
Teaching:	• Student supervision in the context of individual and group assignments • Introductory lectures to the practical projects
Theoretical:	• Parametric inversion • Statistical analysis • Stochastic modelling • Spherical harmonic functions • Digital signal processing • Coordinate transformations/quaternion arithmetic • Fourier analysis
Articles review:	Successfully completed the review of 8 scientific articles, cf. Publons [35]
Computational:	• Algorithm development and implementation • Data management, analysis and visualisation • Automation, robustness, fault recovery • Problem resolution/solution discovery/hacking
Software:	Latex, MS Office, Git, SVN

[34] data-assimilation.com
[35] publons.com/a/782170/

Programming:	• 1996 – present: Bash • 1998 – present: Matlab • 2002 – present: Fortran • 2006 – 2008: C/C++ • 2011 – present: Ruby • 2015 – present: Python
OSs[36]:	OSX, MS Windows, Unix/Linux

Fields of Interest

Space geodesy

Earth System modelling

Digital signal processing

Numerical Simulation

Big data

Rocket Motion and Orbital Mechanics

Preliminary Vehicle Design

Aerodynamics

Structural Mechanics

Collaborations

2017 – present	Collaboration with Dr. Guillaume Ramillien from CNRS[37] and Dr. Aleš Bezděk the ASU[38] of the AVCR[39] to **drive surface mass variations directly from "reduced" gravimetric data** (i.e. observations "cleaned" of non-gravitational and trivial gravitational effects).
2017 – present	Collaboration with Dr. Noble Hatten and Dr. Dae Lee of the CSR. UTexas for the **development of a CubeSat architecture that replicates the gravimetric capabilities of the GRACE satellites**.
2016 – present	International collaboration with Prof. Luis Rocha of UMinho[40] and Dr. Dae Lee of the CSR, UTexas for the **development of a MEMS-based space accelerometer as a first step towards the nano-gravimetric satellite framework**.

[36] Operating Systems
[37] Centre National de la Recherche Scientifique, www.cnrs.fr/index.php
[38] Astronomical Institute, www.asu.cas.cz/en
[39] Czech Academy of Sciences, www.avcr.cz/en/
[40] Universidade do Minho, www.uminho.pt/EN

2015 – present	International collaboration with Prof. Torsten Mayer-Gürr of the IfG[41] of the TUG[42], Dr. Aleš Bezděk of the ASU of the AVCR[43], Prof. Adrian Jäggi of the AIUB[44], Prof. Pieter Visser of the Aerospace Faculty [45] of the TU Delft and Prof. C.K. Shum of the SES[46] of the OSU[47] for the **study of the time-variable gravity field of the Earth estimated from GPS data collected by the Swarm Satellite mission** [48]. Within the scope of this project, we submitted a grant application with very positive reviews (Ref. ESA AO/1-7927/14/NL/MP), and have recently been awarded funding under the ITT posted by the ESA-funded aDISC consortium [49]
2014 – present	Collaboration with TU Delft on the DopTrack project [50], consisting of a **satellite tracking radio station that exploits the Doppler effect**; co-initiated and promoted the project, secured departmental funding, selected and assembled the hardware, developed software, engaged students and mentored practical undergraduate projects.

Research Projects

2013 – 2015	Assessment of Satellite Constellations for Monitoring the Variations in Earth's Gravity Field (ESA contract 4000108663/13/NL/MV)
2013	GOCE+ Theme3: Air density and wind retrieval using GOCE data (ESA contract 400010284/11/NL/EL)
2011 – 2016	Development of the Swarm Level 2 Algorithms and Associated Level 2 Processing Facility (ESA Contract 4000102140/10/NL/JA)
2010	Assessment of a Next Generation Gravity Mission for Monitoring the Variations of Earth's Gravity Field (ESTEC contract 22643/09/NL/AF)
2008	Monitoring and Modelling Individual Sources of Mass Distribution and Transport in the Earth System by Means of Satellites (ESA contract 20403)

Journal publications

Bezděk, A., Sebera, J., **Encarnação, J. T.**, Klokočník, J., (2016). "Time-variable gravity fields derived from GPS tracking of Swarm". In: *Geophys. J. Int.* 205.3, pp. 1665–1669. DOI: 10.1093/gji/ggw094.

Siemes, C., **de Teixeira da Encarnação, J.**, Doornbos, E., IJssel, J., Kraus, J., Pereštý, R., Grunwaldt, L., Apelbaum, G., Flury, J., Holmdahl Olsen, P. E., (2016). "Swarm ac-

[41] Institute of Geodesy, www.itsg.tugraz.at
[42] Graz University of Technology, www.tugraz.at
[43] Czech Academy of Sciences, www.avcr.cz/en/
[44] Astronomical Institute of the University of Bern, www.aiub.unibe.ch
[45] www.lr.tudelft.nl
[46] School of Earth Science, earthsciences.osu.edu
[47] Ohio State University, www.osu.edu
[48] earth.esa.int/web/guest/missions/esa-operational-eo-missions/swarm
[49] tinyurl.com/SwarmGrav
[50] doptrack.tudelft.nl

celerometer data processing from raw accelerations to thermospheric neutral densities". In: *Earth, Planets Sp.* 68.1, p. 92. DOI: 10.1186/s40623-016-0474-5.

Teixeira da Encarnação, J., Arnold, D., Bezděk, A., Dahle, C., Doornbos, E., IJssel, J., Jäggi, A., Mayer-Gürr, T., Sebera, J., Visser, P., Zehentner, N., (2016). "Gravity field models derived from Swarm GPS data". In: *Earth, Planets Sp.* 68.1, p. 127. DOI: 10.1186/s40623-016-0499-9.

IJssel, J., **Encarnação, J.**, Doornbos, E., Visser, P., (2015). "Precise science orbits for the Swarm satellite constellation". In: *Adv. Sp. Res.* 56.6, pp. 1042–1055. DOI: 10.1016/j.asr.2015.06.002.

Hashemi Farahani, H., Ditmar, P., Klees, R., **Encarnação, J.**, Liu, X., Zhao, Q., Guo, J., (2013). "Validation of static gravity field models using GRACE K-band ranging and GOCE gradiometry data". In: *Geophys. J. Int.* 194.2, pp. 751–771. DOI: 10.1093/gji/ggt149.

Olsen, N., Alken, P., Beggan, C. D., Chulliat, A., Doornbos, E., **Encarnação, J.**, Floberghagen, R., Friis-Christensen, E. A., Hamilton, B., Hulot, G., IJssel, J., Kuvshinov, A. V. A., Lesur, V., Luhr, H., Macmillan, S., Maus, S., Olsen, P. E. H., Park, J., Plank, G., Püthe, C., Ritter, P., Rother, M., Sabaka, T. J., Stolle, C., Thebault, E., Thomson, A. W. P., Tøffner-Clausen, L., Velimsky, J., Visser, P. N.A. M., Luehr, H., Noja, M., Puethe, C., Rauberg, J., Schachtschneider, R., Sirol, O., Toeffner-Clausen, L., Vigneron, P., Puthe, C., Velímský, J., (2013). "The Swarm Satellite Constellation Application and Research Facility (SCARF) and Swarm data products". In: *Earth, Planets Sp.* 65.11, p. 100. DOI: 10.5047/eps.2013.07.001.

Visser, P., Doornbos, E., IJssel, J., **Teixeira da Encarnação, J.,** (2013). "Thermospheric density and wind retrieval from Swarm observations". In: *Earth, Planets Sp.* 65.11, pp. 1319–1331. DOI: 10.5047/eps.2013.08.003.

Ditmar, P., **Encarnação, J.**, Hashemi Farahani, H., (2012). "Understanding data noise in gravity field recovery on the basis of inter-satellite ranging measurements acquired by the satellite gravimetry mission GRACE". In: *J. Geod.* 86.6, pp. 441–465. DOI: 10.1007/s00190-011-0531-6.

Gunter, B. C., **Encarnacao, J.**, Ditmar, P., Klees, R., (2011). "Using Satellite Constellations for Improved Determination of Earth's Time-Variable Gravity". In: *J. Spacecr. Rockets* 48.2, pp. 368–377. DOI: 10.2514/1.50926.

Encarnação, J., Klees, R., Zapreeva, E., Ditmar, P., Kusche, J., (2008). "Influence of Hydrology-Related Temporal Aliasing on the Quality of Monthly Models Derived from GRACE Satellite Gravimetric Data". In: *Obs. our Chang. Earth* 133, pp. 323–328. DOI: 10.1007/978-3-540-85426-5_38.

Resendes, D. P., Mota, S., Mendonça, J. T., Sanders, B., **Encarnação, J.**, Del Amo, J. G., (2007). "Laser Propulsion for Ground Launch". en. In: *J. Propuls. Power* 23.1, pp. 73–80. DOI: 10.2514/1.24527.

Conference proceedings (peer-reviewed)

Gunter, B. C., **Encarnação, J.**, Ditmar, P, Klees, R, Van Barneveld, P. W. L., Visser, P, (2012). "Deriving global time-variable gravity from precise orbits of the Iridium NEXT constellation". In: *Adv. Astronaut. Sci.* Vol. 142, pp. 2087–2096. URL: http://www.univelt.com/book=3354.

Gunter, B. C., Ditmar, P., **Encarnação, J.,** (2010). "The determination of time variable gravity from a constellation of non-dedicated satellites". In: *Adv. Astronaut. Sci.* Pittsburgh, pp. 1999–2007. URL: http://www.univelt.com/book=1349.

Gunter, B. C., **Encarnação, J.**, Ditmar, P., Klees, R., (2009). "The use of satellite constellations and formations for future gravity field missions". In: *Adv. Astronaut. Sci.* Savannah, pp. 1357–1368. URL: http://www.univelt.com/book=1451.

Encarnação, J., Ditmar, P., Liu, X., (2008). "Analysis of Satellite Formations in the Context of Gravity Field Retrieval". In: *3rd Int. Symp. Form. Flying, Mission. Technol.* Ed. by K Fletcher. Vol. ESA SP-654. Rijswijk: ESA Communication Production Office, pp. 1–9. URL: https://pure.tudelft.nl/portal/en/publications/analysis-of-satellite-formations-in-the-context-of-gravity-field-retrieval(1489930e-7dbd-4a4b-9bf2-f15b8380ad12).html.

Resendes, D. P., Mota, S., Mendonça, J. T., Sanders, B., **Encarnação, J.**, Amo, J. G., Myrabo, L. N., (2006). "Laser Propulsion for ESA Missions: Ground to Orbit Launch Project Overview — Part 1". en. In: *AIP Conf. Proc.* Vol. 830. 1. AIP, pp. 576–587. DOI: 10.1063/1.2203299.

Resendes, D. P., Mota, S., Mendonça, J. T., Sanders, B., **Encarnação, J.**, Amo, J. G., Prins, T. N. O., (2005). "Laser Propulsion for Ground to Orbit Launch". In: *29th Int. Electr. Propuls. Conf.* IEPC-2005-310, pp. 1–8. URL: http://erps.spacegrant.org/uploads/images/images/iepc_articledownload_1988-2007/2005index/310.pdf.

Invited Presentations

Teixeira Encarnação, J. (2017). "Satellite Gravimetry". In: *Summer Sch. Data Assim. its Appl. Oceanogr. Hydrol. Risk Saf. Reserv. Eng.* Sibiu, Romania. URL: http://data-assimilation.com.

Teixeira Encarnação, J., Arnold, D., Bezdek, A., Dahle, C., Doornbos, E., Ijssel, J. V. D., Jäggi, A., Mayer-gürr, T., Sebera, J., Visser, P., Zehentner, N., (2015). "First monthly gravity field solutions derived from GPS orbits of Swarm". In: *AGU Fall Meet. Abstr.* San Francisco, CA, USA. URL: https://agu.confex.com/agu/fm15/webprogram/Paper71877.html.

Conference Attendance

Teixeira Encarnação, J., Arnold, D., Bezdek, A., Dahle, C., Doornbos, E., Ijssel, J. V. D., Jäggi, A., Mayer-gürr, T., Sebera, J., Shum, C., Visser, P., Zehentner, N., (2017a). "Gravity field models derived from Swarm GPS data". In: *EGU Gen. Assem.* Vienna, Austria. URL: https://www.researchgate.net/publication/319914485_Gravity_field_models_derived_from_Swarm_GPS_data.

Teixeira Encarnação, J., Arnold, D., Bezdek, A., Dahle, C., Jäggi, A., Mayer-gürr, T., Sebera, J., Shum, C., Visser, P., Zehentner, N., (2017b). "Swarm as an Observing Platform for Large Surface Mass Transport Processes". In: *4th Swarm Sci. Meet.* Banff, Canada. URL: http://tinyurl.com/Swarm-Banff.

Teixeira Encarnação, J., Arnold, D., Bezdek, A., Dahle, C., Doornbos, E., Ijssel, J. V. D., Jäggi, A., Mayer-gürr, T., Sebera, J., Visser, P., Zehentner, N., (2016a). "Gravity field models derived from Swarm GPS data". In: *ESA Living Planet*. Prague, Czech Republic. DOI: 10.13140/RG.2.1.2729.8162.

Teixeira Encarnação, J., Arnold, D., Bezdek, A., Dahle, C., Jäggi, A., Mayer-gürr, T., Sebera, J., Visser, P., Zehentner, N., (2016b). "Gravity field models derived from Swarm GPS data". In: *EGU Gen. Assem.* Vienna, Austria. DOI: 10.13140/RG.2.1.3909.4642.

Encarnacao, J., Ditmar, P., Klees, R., (2015). "Impact of Orbit Position Errors on Future Satellite Gravity Models". In: *Am. Geophys. Union, Fall Meet. 2015*. G31B-1114. URL: http://adsabs.harvard.edu/abs/2015AGUFM.G31B1114E.

Teixeira Encarnação, J., IJssel, J., Doornbos, E., Visser, P. N., (2015). "Frequency domain combination of POD-driven and measured accelerations". In: *5th Swarm Data Qual. Work.* Paris, France.

Teixeira Encarnação, J. G., IJssel, J., Doornbos, E., Visser, P., (2014a). "POD-assisted calibration of Swarms Accelerometer Data". In: *4th Swarm Data Qual. Work.* December. Postdam, Germany.

Teixeira Encarnação, J., Doornbos, E., IJssel, J., Visser, P. N., (2014b). "Combination of Swarm's Uncalibrated Accelerometer Data with POD-Based Accelerometry". In: *3rd Swarm Sci. Meet.* Copenhagen, Denmark, p. 2.

Teixeira Encarnação, J., IJssel, J., Doornbos, E., Visser, P. N., (2014c). "Preliminary analysis of accelerometer data". In: *2nd Swarm Data Qual. Work.* Rome, Italy.

Encarnação, J., Ditmar, P., Liu, X., (2008). "Analysis of Satellite Formations in the Context of Gravity Field Retrieval". In: *3rd Int. Symp. Form. Flying, Mission. Technol.* Ed. by K Fletcher. Vol. ESA SP-654. Rijswijk: ESA Communication Production Office, pp. 1–9. URL: https://pure.tudelft.nl/portal/en/publications/analysis-of-satellite-formations-in-the-context-of-gravity-field-retrieval(1489930e-7dbd-4a4b-9bf2-f15b8380ad12).html.

Teixeira Encarnação, J., Ditmar, P. G., Klees, R., (2008). "Spectral analysis of positioning modelling errors in gravimetric data". In: *IAG Symp. Gravity, Geoid, Earth Obs.* Chania, Greece.

Teixeira Encarnação, J. G., Ditmar, P. G., Klees, R., (2007a). "Temporal aliasing in GRACE monthly solutions". In: *Intergeo*. Leipzig, Germany.

Teixeira Encarnação, J., Ditmar, P. G., Klees, R., (2007b). "Influence of hydrology-related temporal aliasing on the quality of monthly models derived from GRACE satellite gravimetric data". In: *VMSG Symp.* Utrecht, The Netherlands.

Encarnação, J. (2002). "Single Stage To Orbit Minimum Requirements Through Numerical Simulation". In: *34th COSPAR Sci. Assem. Second World Sp. Congr.* Houston, TX, USA: IAF. URL: http://adsabs.harvard.edu/abs/2002iaf..confE.984T.

Conference Contributions

Doornbos, E., **de Teixeira da Encarnação**, t., IJss, J., Siemes, C., Grunwaldt, L., Peresty, R., Kraus, J., Flury, J., Apelbaum, G., Olsen, P. E. H., (2016). "Thermospheric neutral densities derived from Swarm accelerometer and GPS data". In: *ESA Living Planet Symposium 2016*.

Jäggi, A., Meyer, U., Jean, Y., Susnik, A., Dach, R., Weigelt, M., Dam, T., Li, Z., Chen, Q., Flechtner, F., (2016). "European Gravity Service for Improved Emergency Management–Status and Project Highlights". In: *International Association of Geodesy Symposia*. Springer, p. 1.

Siemes, C., Grunwaldt, L., Peresty, R., Kraus, J., Doornbos, E., **de Teixeira da Encarnação**, t., IJssel, J., Flury, J., Apelbaum, G., Olsen, P. E. H., (2016). "Improvements of the Swarm Accelerometer Data Processing". In: *ESA Living Planet Symposium 2016*.

Astafyeva, E, Zakharenkova, I, Foerster, M, Doornbos, E, **de Teixeira da Encarnação**, t., Siemes, C, (2015). "Ionospheric and Thermospheric Response to the 2015 St. Patrick's Day Storm: a Global Multi-Instrumental Overview". In: *AGU Fall Meeting Abstracts*.

Doornbos, E, Siemes, C, **de Teixeira da Encarnação**, t., Perestý, R, Grunwaldt, L, Kraus, J, Holmdahl Olsen, P., IJssel, J, Flury, J, Apelbaum, G, (2015). "Processing of Swarm Accelerometer Data into Thermospheric Neutral Densities". In: *AGU Fall Meeting Abstracts*.

Siemes, C., **Encarnacao, J.**, Doornbos, E., Perestý, R., Grunwaldt, L., Kraus, J., Olsen, P. E. H., IJssel, J., Flury, J., Apelbaum, G., (2015). "Processing of Swarm Accelerometer Data into Thermospheric Neutral Densities". In: *AGU Fall Meet. Abstr.* Abstract SA31D-2371. San Francisco, CA, USA. URL: http://abstractsearch.agu.org/meetings/2015/FM/SA31D-2371.html.

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Miscellaneous Contributions

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Languages

	Speaking	Reading	Writing
Portuguese		mother tongue	
English[51]	excellent	excellent	excellent
Spanish	good	good	fair
Italian	good	good	fair
Dutch	fair	fair	limited
French	fair	fair	limited

Personal development

Sep. 2015	Scientific Writing, Sören Johnson, TU Delft
Jul. 2017	Leading without formal authority, Emil Kresl, UTexas
Jul. 2017	Meeting effectiveness, Emil Kresl, UTexas
Sep. 2017	Dealing with Difficult People, Jeff Stellmach, UTexas

Sports

1991 – 2009	Basketball
April 2006	Finalist of the 26th International Fortis Marathon of Rotterdam [53]
September 2016 - present	Sailing

Other Activities

1991 – 2001	Scout at the 92^{nd} Scout-group of the Association of Portuguese Escoteiros [54]
1993 – present	Radio Amateur, call sign CT3IU, class B

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