

Curriculum vitae

May, 2015

Name	Jens Olof Ormö
Date of birth	13/6 1968
Nationality	Swedish
Current position	Research scientist [Científico Titular de Organismo Publico de Investigación (Funcionario/civil servant)], Centro de Astrobiología, Instituto Nacional de Técnica Aeroespacial, Spain 2/1 2009 -

Academic achievements

Scientific Career

- Científico Titular de Organismo Público de Investigación-Funcionario (research scientist /civil servant), Centro de Astrobiología, Instituto Nacional de Técnica Aeroespacial, Spain 2/1 2009--
- Staff scientist contracted by Ingeniera y Servicios Aeroespaciales S.A. 2008 1/3 2007-31/12
- **Ramon y Cajal research position** at the Centro de Astrobiología (Instituto Nacional de Técnica Aeroespacial), Torrejon de Ardoz (Madrid), Spain. 1/3 2002-28/2 2007
- Post-doctoral position at the International Research School of Planetary Sciences, Pescara, Italy. The period includes 24 months **Marie Curie post-doctoral fellowship**. 1/9 1999-28/2 2002
- Ph.D. Stockholm University. Thesis title: Impact cratering at sea. (Supervisor: Prof. Maurits Lindström) 26/11 1998
- Ph.Lic. Stockholm University. Thesis title: Fossiliferous Ordovician sediments related to marine impact craters. 24/4 1996
- M.Sc. Stockholm University. Thesis title: Studies on the pre-impact sedimentary rocks of the Tvären Bay impact structure, SE Sweden. 21/10 1993

Included in the higher education:

Two years of geology studies (in German) at the Philipps-Universität, Marburg, Germany.	1991-1993
One semester of geology studies (in Norwegian) at the University of Tromsø, Norway.	1995

Courses taken on post-doc and higher level

International Summer School in Astrobiology: Origins: From the Big Bang to Life. Santander, Spain, 10-14 July 2006.

Mars Express Data Workshop: HRSC & OMEGA. ESAC, Villafranca del Castillo, Madrid, Spain, 11-15 June 2007.

Related employment

- Swedish Institute of Space Physics
Participation in the development of a ground penetrating radar for a proposed lunar mission. 8/2-31/3 99
- Swedish Geological Survey (SGU)
Mapping in the field 19/7 94 - 24/8 94
- X Minerals AB
Mineral prospecting 12/11 93 - 11/2 94
- The Swedish State Mining Property Commission (NSG)
Prospecting and mapping in the field. July-August 1991
- The Swedish Broadcasting Corporation SVT
Consultant at translations of scientific TV programmes 1990's Occasionally during the

Honorships and awards

Ramon y Cajal 2002-2007	Swedish Space Board 1997	ERASMUS 1995
EU Marie Curie 2000-2002	Liljevalchs fund 1997	Nordenskjöldska Swedenb. fund 1995
Swedish Institute 1999	NorFA 1997	Gavelinfund 1994
Swedish Space Board 1999	Swedish Space Board 1996	Kobbs, Gustaf och Ellen fund 1994
Lennanders fund 1999	Th Nordströms fund 1995	John Söderbergs fund 1993
NorFA 1998	Ograd. forskares fund 1995	ERASMUS 1992
Swedish Space Board 1998	Von Beskows fund 1995	
Th Nordström fund 1997	NorFA 1995	

Responsibilities

- Member of the Editorial Board of Scientific Reports, Nature Publishing Group, June 2015-
- Member of the Board of the Scandinavian School in Madrid, Spain. 2012-2014
- Vice chairman of the Geologklubben, Stockholm University, 1996.
- Graduate students' representative in the Department Board, Dept. of Geology and geochemistry, Stockholm University, 1995.
- Chairman of the Geologens Klätterklubb (The Mountaineering club of the geologists, Stockholm University), 1988.
- Creator and coordinator of the Laboratory of Experimental Impact Cratering, at Centro de Astrobiología, Spain.

Supervision of students

- Pascual Tabares (2010-2012), MSc thesis "Drill-core and geophysical investigation of the western crystalline rim of Wetumpka impact structure, Alabama". Auburn University, Alabama, USA. [External co-supervisor with Dr. David King, Auburn University. Member of the MSc thesis committee]
- Irene Melero Asensio (1st October 2009 to 30th September 2013), Ph.D project "Meteorite impact craters in layered targets: Geophysical modeling and simulation". Centro de Astrobiología/Universidad Complutense, Spain. [Director of the thesis and principal supervisor in collaboration with Dr. Fatima Martin Hernandez, Univ. Complutense]

Academic tasks

- President of the tribunal at the Ph.D. thesis defence by Andreas Johnsson, 5 October 2012, Gothenburg University. Thesis title: "Cold-climate landforms on Mars and Earth-analogues in Svalbard".
- Examiner (anonymous) of Ph. D. thesis to be defended at University of Adelaide, Australia, 2015.

Additional information

- Swedish: mother tongue, English: fluent written/oral, German: good oral, good written, Italian: some knowledge, Spanish: fair oral, some knowledge written.
- Military service at The Lapland Mountain Ranger Regiment (Second Lieutenant), Kiruna, Sweden, June 1989-August 1990.
- Driving licence for car and light truck.

Participation in projects

- **Principal Investigator** of two consecutive projects both entitled "Impact Craters as Indicators for Upper Crust Properties and Paleoenvironments of Planets and Natural Satellites", Spanish Ministry for Education and Science, 2003-2007, Refs. AYA2003-01203 and CGL2004-03215. Total funding: 9200+46000=55200 Euro.
- **Participating scientist** in the USGS-ICDP Deep Drilling of the Chesapeake Bay Impact Crater, USA, 2005-2006. Principal investigators: Gregory S. Gohn, U.S. Geological Survey, Christian Koeberl, University of Vienna, Kenneth G. Miller, Rutgers University, Wolf Uwe Reimold, Humboldt University.
- **Co-Principal Investigator** of the NASA Geophysics and Geology project "Shallow exploratory core drilling at Wetumpka impact structure, a marine-target crater in Alabama, USA". March 1, 2009 to February 28, 2011. Ref. NNX09AD90G. Co-P.Is.: David King, Auburn University and Jens Ormö. Collaborators: Lucille Petruny and Scott Harris. Total funding: 189 000 USD.
- **Collaborator** in the NASA-Mars Fundamental Research: "Characterization and Genesis of Terrestrial Analogs of Mars Hematite ". May 1, 2008 to April 30, 2010. P.I.: Marjorie A. Chan (Award # NNG06GI10G) Co-Is: William Parry, John Bowman, Erich Petersen. Collaborators: M. Darby Dyer, Jens Ormö, Goro Komatsu. Total funding: 327.000 USD
- **Co-Principal Investigator** of The Swedish Research Council project "Concentric Palaeozoic astroblems in Sweden - the Lockne and Siljan craters". 2010-2012. ref 90449201. Co-P.Is: Erik Sturkell, Jens Ormö, Christopher Juhlin, Anette Högström, Reinhard O. Greiling. Co-Is: Jan Bergström, Stig M. Bergström, Mikael Calner, Jan Ove R. Ebbestad, Dr. Oliver Lehnert, Maurits Lindström. Total funding: 1.800.000 SEK (172.432 Euro)
- **Co-Investigator** of the project "Development, operation and exploitation of space telescopes: INTEGRAL-OMC, BepiCol-MIXS and PLATO", Spanish Ministry for Science and Innovation, 2009-2011, Ref. AYA2008-03467/ESP. P.I.: Miguel Mas Hesse, CAB (CSIC-INTA). Total funding: 5.062.640 Euro.
- **Co-Investigator** on the NASA project "Mars for Earthlings: A terrestrial analog approach for Earth and Planetary Science teaching and outreach". NASA EPOESS (Award # NNX11AH29G), July 1 2011 June 30 2014. Principal Investigator: Marjorie Chan. Total funding: 356 261 USD.
- **Co-investigator** of the project "Desarrollo, operacion y explotacion de telescopios espaciales: INTEGRAL-OMC, Bepi Colombo-MIXS y PLATO", Spanish Ministry for Economy and Competitiveness, 2012-2013, AYA2011-24780/ESP. P.I.: Miguel Mas Hesse, CAB (CSIC-INTA). Total funding: 580.800Euro

- **Co-investigator** of the project “Desarrollo, operacion y explotacion de telescopios espaciales: INTEGRAL-OMC, Bepi Colombo-MIXS y PLATO”, Spanish Ministry for Economy and Competitiveness, 2013-2015, AYA2012-39362-C02-01. P.I.: Miguel Mas Hesse, CAB (CSIC-INTA). Total funding: 573.500Euro
- **Collaborator** in the project “Constraining the Ordovician impact cratering rate on a global scale – Clues to the evolution of an asteroid break-up and the terrestrial consequences”. Swedish Research Council, 2013-2017. P.I.: Carl Alwmark, Lund University, Sweden. Total funding: 1.300.000 SEK.
- **Collaborator** on the NASA project “Origin and evolution of Flynn Creek crater, Tennessee: Implications for impact-induced hydrothermal activity on Mars” 2015-2018. Ref 14-SSW14-0380. Principal Investigator Dr. Justin Hagerty, United States Geological Survey, Flagstaff, AZ, USA. Total funding: 512 000 USD.
- **Co-Principal Investigator** of the project “Desarrollo, operacion y explotacion de telescopios espaciales: INTEGRAL-OMC, Bepi Colombo-MIXS, PLATO y Athena”, Spanish Ministry for Economy and Competitiveness, 2015-2016, ESP2014-59789-P. P.I.s: Miguel Mas Hesse, CAB (CSIC-INTA) and Jens Ormö, CAB (CSIC-INTA). Total funding: 400 000E.
- **Co-Principal applicant** of the 3 years (2016-2018) project “The Lockne – Målingen doublet (LMD): Anatomy of a marine impact by a binary, ‘rubble pile’ asteroid” submitted to the Swedish Research Council. Requested amount: 2 089 000SEK
- **Co-Principal applicant** of the NASA project proposal in preparation “Wetumpka Impact Structure, Alabama: Effects of a water-saturated, layered target on the morphology of a 5-km impact crater and implications for wet target impacts on Mars”. Principal Investigators Dr. David King, Auburn University, Al, USA, and Jens Ormö, CAB (INTA-CSIC). Requested amount: 351 015 USD

Organization of academic activities (e.g., conferences, workshops)

1. Executive member of the organizing committee of the conference “Impact craters as indicators for planetary environmental evolution and astrobiology”, Östersund (Sweden), June 8 - 14, 2006.
2. Co-organizer with Prof. David King (Auburn University, USA) of Geological Society of America Field Forum “Marine impact craters on Earth: Field investigation of the Wetumpka impact structure, a well-preserved marine impact crater, and the K-T boundary in the Alabama Gulf Coastal Plain”, 8-11 March 2007, Wetumpka, Alabama, USA.
3. Co-organizer of Excursion no. 10 “Palaeozoic impact craters” at the 33rd International Geological Congress, Oslo, Norway, 6-14 August, 2008.
4. Co-convener of the session “Impact Processes in the Solar System” at the 2012 European Planetary Science Congress, IFEMA-Feria de Madrid, 23 – 28 September, Madrid, Spain.

Academic activities

I began to study earth sciences at the Stockholm University (SU) in 1987. My higher education included 2 years of studies in Germany (in German) and one semester in Norway, both partially supported by ERASMUS. In 1998 I defended my Ph.D thesis “Impact Cratering at Sea” at SU. The thesis earned me a 2 years Marie Curie post-doctoral fellowship at the International Research School of Planetary Sciences in Italy. This was followed in 2002 by a 5 years Ramon y Cajal position at the Centro de Astrobiología (CAB) in Spain. Geological processes in connection to cosmic impacts are a central part of my research. Impact cratering is among the most important geological processes in the Solar System, ever since the accretion of planets until being a factor for the evolution of life and threat to human civilization. I focus on impacts where volatiles (e.g., water) form part of the target. I have shown that craters formed in shallow seas

strongly diverge from land-target craters. As the main part of the Earth surface throughout the history of the planet has been covered by sea, knowledge about marine-target craters is essential to understand the planet's geological and biological evolution. Likewise, volatile-rich targets still exist in many other parts of the Solar System and may indicate potential life habitats. But the crater studies need to be complemented by studies of other environmental indicators to complete the picture of the environment before and after an impact event, and to evaluate the effects of the impact. For instance, I have used remote sensing, fieldwork at analogue sites, and laboratory experiments to show how the enigmatic "blueberries" in Meridiani Planum on Mars were formed by migration of fluids through permeable sediments leading to the precipitation of hematite concretions. It is considered a very important indication for warm and wet past conditions, which in turn seems to be a prerequisite for life as we know it.

I am very interested in the development of new technologies to assist the work (e.g., instrumentation for lunar and Mercury missions, instrumentation for autonomous robotics). My present work at CAB includes the creation of a world-unique laboratory for projectile impact simulations of a.o. impacts into marine or other volatile-rich targets. The specially made building contains new equipment of my own design including a 7 m wide test bed, a camera tank for quarter space experiments, and a projectile launcher with the capacity to launch 20mm projectiles at various angles and into various targets. The results are documented with high-speed cameras and 3D scanner.

I have been PI, co-PI, and collaborator in a number of projects that have included fieldwork in remote locations as well as large drilling enterprises in both confirmed and suggested impact craters in Sweden, Italy, and USA. One recent project led to the discovery of the first known terrestrial impact site from a binary asteroid. The work was acknowledged by BBC (<http://www.bbc.com/news/science-environment-26172181>). In 2011 National Geographic broadcasted an 1h documentary about my work on potential effects from impacts on humanity ("Fireball of Christ").

The impact experiments, fieldwork at terrestrial impact craters, and studies of planetary surface features are cornerstones in my planetary research. My hope is to strengthen the field of planetary geology within European space sciences.

List of publications by Jens Ormö

Peer-reviewed articles (listed by year):

2015

- Alwmark, C., Ferrière, L., Holm-Alwmark, S., **Ormö, J.**, Leroux, H, and Sturkell, E., 2015: "Impact origin for the Hummeln structure (Sweden) and its link to the Ordovician disruption of the L chondrite parent body". *Geology*, published online on 18 February 2015 as doi:10.1130/G36429.1
- King, D. T., Jr., Morrow, J. R., Petruny, L. W., and **Ormö, J.**, 2015: "The surficial polymict impact breccia unit, Wetumpka impact structure, Alabama: Shock levels and emplacement mechanism", In Osinski, G., and Kring, D.A., eds., Large meteorite impacts and planetary evolution V, *Geological Society of America Special Publication XXX* (In press).
- Ormö, J.**, Melero-Asensio, I., Housen, K., Wünnemann, K., Elbeshausen, D., and Collins, G., 2015: "Scaling and reproducibility of craters produced at the Experimental Projectile Impact Chamber (EPIC), Centro de Astrobiología, Spain". *Meteoritics and Planetary Science* (Accepted).
- Schmieder, M., Ferrière, L., **Ormö, J.**, Buchner, E., Koeberl, C., and Reimold, W. U., 2015: "Comment on: "Direct evidence of ancient shock metamorphism at the site of the 1908 Tunguska event", by P. Vannucchi et al. [Earth Planet. Sci. Lett. 409 (2015), 168–174]". *Earth and Planetary Science Letters* Vol. 419, 222-223.

2014

- Alwmark, C., Alwmark-Holm, S., **Ormö, J.**, and Sturkell, E., 2014: "Shocked quartz grains from the Målingen structure, Sweden – Evidence for a twin crater of the Lockne impact structure". *Meteoritics and Planetary Science*. Vol. 49(6), 1076-1082.
- McGuire, P. C., Bonnici, A., Bruner, K. R., Gross, C., **Ormö, J.**, Smosna, R. A., Walter, S., and Wendt, L., 2014: "The Cyborg Astrobiologist: matching of prior textures by image compression for geological mapping and novelty detection". *International Journal of Astrobiology*, Vol. 13(3), 191-202 .
- Melero-Asensio, I., Martin-Hernandez, F., and **Ormö, J.** 2014: "A rock magnetic profile through the ejecta flap of the Lockne impact crater (central Sweden) and implications for the impact excavation process", *Journal of Applied Geophysics*, doi: 10.1016/j.jappgeo.2014.11.009.
- Ormö, J.**, Sturkell, E., Nölvak, J., Melero-Asensio, I., Frisk, Å., and Wikström, T., 2014: "The geology of the Målingen structure: A probable doublet to the Lockne marine-target impact crater, central Sweden". *Meteoritics and Planetary Science*, Vol. 49(3), 313–327.
- Ormö, J.**, Sturkell, E., Alwmark, C., and Melosh, J., 2014: "First known Terrestrial Impact of a Binary Asteroid from a Main Belt Breakup Event". *Scientific Reports* 4:6724 | DOI: 10.1038/srep06724.

2013

- Ivarsson, M., Broman, C., Sturkell, E., **Ormö, J.**, Siljeström, S., van Zuilen, M., and Bengtson, S., 2013: "Fungal colonization of an Ordovician impact-induced hydrothermal system". *Nature Scientific Reports* 3:3487.
- Ormö, J.**, Rossi, A.P., and Housen, K.R., 2013: "A new method to determine the direction of impact: Asymmetry of concentric impact craters as observed in the field (Lockne), on Mars, in experiments, and simulations". *Meteoritics and Planetary Science*, Vol. 48(3), 403-419.
- Sturkell, E., **Ormö, J.**, and Lepinette, A., 2013: "Early modification stage (pre-resurge) sediment mobilization in the Lockne concentric, marine-target crater, Sweden". *Meteoritics and Planetary Science*, Vol. 48(3), 321-338.

Tabares-Rodenas, P., **Ormö, J.**, and King, D. T. Jr., 2013: "Cosmic wabi-sabi: Tell-tale morphological imperfections in impact crater shapes revealed by numerical analysis". *Earth and Planetary Science Letters*, Vol. 377–378, 211–217.

Tabares, P., King, D. T., Jr., and **Ormö, J.**, 2013: "Drill-core and geophysical investigation of the western part of the crystalline rim, Wetumpka impact structure, Alabama". *Gulf Coast Association of Geological Societies Transactions*, Vol. 63, 439–448.

2011

Chan, M.A., Nicoll, K., **Ormö, J.**, Okubo, C., and Komatsu, G., 2011: "Utah's geologic and geomorphic analogs to Mars: An overview for planetary exploration", in Garry, W.B., and Bleacher, J.E., eds., *Analogues for Planetary Exploration: Geological Society of America Special Paper*, Vol. 483, 349-375, doi:10.1130/2011.2483(22).

King, D.T., and **Ormö, J.**, 2011: "The marine-target Wetumpka impact structure examined in the field and by shallow core-hole drilling", in Garry, W.B., and Bleacher, J.E., eds., *Analogues for Planetary Exploration: Geological Society of America Special Papers*, Vol. 483, 287-300.

2010

Chan, M.A., **Ormö, J.**, Murchie, S., Okubo, C.H., Komatsu, G., Wray, J.J., McGuire, P., McGovern, J.A., and the HiRISE Team 2010: "Geomorphic knobs of Candor Chasma, Mars: New Mars Reconnaissance Orbiter data and comparisons to terrestrial analogs". *Icarus*, Vol. 205(1), 138-153.

Högström, A.E.S., Sturkell, E., Ebbestad, J.O.R., Lindström, M., and **Ormö, J.**, 2010: "Concentric Impact Structures in the Palaeozoic of Sweden – the Lockne and Siljan craters". *GFF*, Vol. 132, 65–70.

McGuire, P.C., Gross, C., Wendt, L., Bonnici, A., Souza-Egipsy, V., **Ormö, J.**, Diaz-Martinez, E., Foing, B.H., Bose, R., Walter, S., Oesker, M., Ontrup, J., Haschke, R., and Ritter, H., 2010: "The Cyborg Astrobiologist: Testing a novelty-detection algorithm on two mobile exploration systems at Rivas Vaciamadrid in Spain and at the Mars Desert Research Station in Utah". *International Journal of Astrobiology*, Vol. 9(1), 11 - 27.

Ormö, J., Gomez-Ortiz, D., Komatsu, G., Bayaraa, T., Tserendug, S. 2010: "Geophysical survey of the proposed Tsenkher impact structure, Gobi Altai, Mongolia". *Meteoritics and Planetary Science*, Vol. 45(3), 373–382.

Ormö, J., Hill, A., and Self-Trail, J.M. 2010: "A chemostratigraphic method to determine the end of impact related sedimentation at marine-target impact craters (Chesapeake Bay, Lockne, Tvären)". *Meteoritics and Planetary Science*, Vol. 45(7), 1206–1224.

Ormö, J., Lepinette, A., Sturkell, E., Lindström, M., Housen, K.R., and Holsapple, K.A. 2010: "Water resurge at marine-target impact craters analyzed with a combination of low-velocity impact experiments and numerical simulations" In: R.L., Gibson, and W.U., Reimold (Eds.) "Large Meteorite Impacts and Planetary Evolution IV". *Geological Society of America Special Paper* 465, p. 81–101.

2009

Ormö, J., Sturkell, E., Horton, J.W., Jr., Powars, D.S., and Edwards, L.E. 2009: "Comparison of clast frequency and size in the Exmore sediment-clast breccia, Eyreville and Langley cores, Chesapeake Bay impact structure: Clues to the resurge process". In: Gohn, G.S., Koeberl, C., Miller, K.G., and Reimold, W.U., (Eds.) "The ICDP-USGS deep drilling project in the Chesapeake Bay impact structure: results from the Eyreville coreholes". *Geological Society of America Special Papers*, Vol. 458, 617-632

2008

Lindström, M., **Ormö, J.**, and Sturkell, E. 2008: "Water-blow and resurge breccias at the Lockne marine-target impact structure". In: K. Evans, J. W. Horton Jr., D.T. King Jr., and J.R. Morrow (Eds.) "The Sedimentary Record of Meteorite Impacts". *Geological Society of America Special Paper*, Vol. 437, 43-54.

2007

- Bartolo, A., McGuire, P. C., Camilleri, K. P., Spiteri, C., Borg, J. C., Farrugia, P. J., **Ormö, J.**, Gomez-Elvira, J., Rodriguez-Manfredi, J. A., Diaz-Martinez, E., Ritter, H., Haschke, R., Oesker, M., and Joerg Ontrup, J. 2007: "The Cyborg Astrobiologist: Porting from a wearable computer to the Astrobiology Phone-cam". *International Journal of Astrobiology*, Vol. 6(4), 255-261.
- Chan, M. A., **Ormö, J.**, Park, A. J., Stich, M., Souza-Egipsy, V., and Komatsu, G. 2007: "Models of iron oxide concretion formation: field, numerical, and laboratory comparisons". *Geofluids*, Vol. 7, 356-368.
- Frisk, Å., and **Ormö, J.** 2007: "Facies distribution of post-impact sediments in the Ordovician Lockne and Tvären impact craters: Indications for unique impact-generated environments". *Meteoritics and Planetary Science*, Vol. 42(11), 1971-1984.
- King, D. T., Jr., **Ormö, J.**, Petruny, L.W., Neathery, T.L., Gilomen, A.T., Glidewell, J. de Villiers, G., and Johnson, R.C. 2007, Marine impact craters on Earth: Field investigation of the Wetumpka impact structure, a well-preserved marine impact crater, and the K-T boundary in the Alabama Gulf Coastal Plain: *GSA Today*, v. 17, no. 9, p. 57-58.
- Lindgren, P.; Parnell, J.; Norman, C.; Mark, D.; Baron, M.; **Ormö, J.**; Sturkell, E.; Conliffe, J.; and Fraser, W. 2007: "Formation of Uranium/thorium-rich bitumen nodules in the Lockne Impact Crater, Sweden: A mechanism for carbon concentration at impact sites". *Meteoritics and Planetary Science*, Vol. 42(11), 1961-1970.
- Ormö, J.**, Gomez-Ortiz, D., McGuire, P. C., Henkel, H., Komatsu, G., and Rossi, A. P. 2007: "Magnetometer survey of the proposed Sirente meteorite crater field, central Italy: Evidence for uplifted crater rims and buried meteorites". *Meteoritics and Planetary Science*, Vol. 42(2), 211-222.
- Ormö, J.**, Sturkell, E., and Lindström, M. 2007: "Sedimentological analysis of resurge deposits at the Lockne and Tvären craters: Clues to flow dynamics". *Meteoritics and Planetary Science*, Vol. 42(11), 1929-1944.

2006

- Horton, J. W., **Ormö, J.**, Powars, D S., and Gohn, G. S., 2006: "Chesapeake Bay Impact structure: Morphology, crater fill, and relevance for impact structures on Mars". *Meteoritics and Planetary Science*, Vol. 41(10), 1613-1624.
- King, D., **Ormö, J.**, Petruny, L.W., and Neathery, T.L., 2006: "Role of water in the formation of the Late Cretaceous Wetumpka impact structure, inner Gulf Coastal Plain of Alabama, USA". *Meteoritics and Planetary Science*, Vol. 41(10), 1625-1631.
- Komatsu, G., Olsen, J.W., **Ormö, J.**, Di Achille, G., Kring, D.A., and Matsui, T., 2006: "The Tsenkher structure in the Gobi-Altai, Mongolia: Geomorphological hints of an impact origin". *Geomorphology* 74. p. 164– 180.
- Ormö, J.**, Koeberl, C., Rossi, A.P. and Komatsu, G., 2006: "Geological and geochemical data from the proposed Sirente crater field: New age dating and evidence for heating of target". *Meteoritics and Planetary Science*, Vol. 41(9), 1331-1345.
- Ormö, J.**, Lindström, M., Lepinette, A., Martinez-Frias, J., and Diaz-Martinez, E., 2006: "Cratering and modification of wet target craters: Projectile impact experiments and field observations of the Lockne marine-target crater (Sweden)". *Meteoritics and Planetary Science*, Vol. 41(10), 1605-1612.
- Souza-Egipsy, V., **Ormö, J.**, Beitler Bowen, B., Chan, M.A., and Komatsu, G., 2006: "Ultrastructural study of iron oxide precipitates: Implications for the search of biosignatures in the Meridiani hematite concretions, Mars". *Astrobiology*, Vol. 6, 527-545.

2005

- Chan, M. A., Beitler Bowen, B., Parry, W. T., **Ormö, J.**, and Komatsu, G., 2005: "Red rock and red planet diagenesis: comparisons of Earth and Mars concretions". *GSA Today*, Vol. 15(8), 4-10.
- Lindström, M., **Ormö, J.**, Sturkell, E., and von Dalwigk, I., 2005: "The Lockne Crater: Revision and reassessment of structure and impact stratigraphy". In: C. Koeberl and H. Henkel (Eds.) "Impact Tectonics". *Impact Studies*. Springer-Verlag, Berlin Heidelberg. p. 357-388.

McGuire, P.C., Diaz Martinez, E., **Ormö, J.**, Gomez Elvira, J., Rodriguez Manfredi, J.A., Sebastian Martinez, E., Ritter, H., Haschke, R., Oesker, M., and Ontrup, J., 2005: "The Cyborg Astrobiologist: Scouting red beds for uncommon features with geological significance". *International Journal of Astrobiology*, Vol. 4(2), 101-113.

Shuvalov, V., **Ormö, J.**, and Lindström, M., 2005: "Hydrocode simulation of the Lockne marine target impact event". In: C. Koeberl and H. Henkel (Eds.) "Impact Tectonics". *Impact Studies*. Springer-Verlag, Berlin Heidelberg. p. 405-422.

2004

Chan, M. A., Beitler, B., Parry, W. T., **Ormö, J.**, and Komatsu, G., 2004: "A possible terrestrial analogue for haematite concretions on Mars". *Nature*, Vol. 429, 731-734.

McGuire, P.C., **Ormö, J.**, Diaz Martinez, E., Rodriguez Manfredi, J.A., Gomez Elvira, J., Ritter, H., Oesker, M., and Ontrup, J., 2004: "The Cyborg Astrobiologist: First Field Experience". *International Journal of Astrobiology*, Vol. 3, 189-207.

Ormö, J., Dohm, J. M., Ferris, J. C., Lepinette, A., and Fairén, A. G., 2004a: "Marine-target craters on Mars? An assessment study". *Meteoritics and Planetary Science*, Vol. 39 (2), 333-346.

Ormö, J., Komatsu, G., Chan, M. A., Beitler, B. and Parry, W. T., 2004b: "Geological features indicative of processes related to the hematite formation in Meridiani Planum and Aram Chaos, Mars: A comparison with diagenetic hematite deposits in southern Utah, USA". *Icarus*, Vol. 171, 295-316.

2003

Ormö, J., and Komatsu, G., 2003: "Mars Orbiter Camera Observation of Linear and Curvilinear Features in the Hellas Basin: Indications for Multiple Processes of Formation". *Journal of Geophysical Research*. Vol. 108 (E6), 5059, doi:10.1029/2002JE001980.

Santilli, R., **Ormö, J.**, Rossi, A.P. and Komatsu, G., 2003: "A catastrophe remembered: A meteorite impact of the 5th century AD in the Abruzzo, central Italy". *Antiquity*, Vol. 77, No. 296, pp. 313-320.

2002

Ormö, J. and Miyamoto, H., 2002: "Computer modelling of the water resurge at a marine impact: the Lockne crater, Sweden". *Deep Sea Research II*, Vol. 49, No. 6, pp. 983-994.

Ormö, J., Rossi, A., and Komatsu, G., 2002: "The Sirente crater field, Italy". *Meteoritics and Planetary Science*, Vol. 37, pp. 1507-1523.

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- von Dalwigk, I. and **Ormö, J.**, 2001: "The formation of resurge gullies during impacts at sea; The Lockne crater, Sweden". 7th ESF-IMPACT Workshop "Submarine craters and ejecta-crater correlation", Longyearbyen, Svalbard, p. 88.
- von Dalwigk, I. and **Ormö, J.**, 2001: "The formation of resurge gullies during impacts at sea; The Lockne crater, Sweden". Geological Society of America Field Forum, Bolide Impacts on Wet Targets, Nevada and Utah, USA.
- von Dalwigk, I. and **Ormö, J.**, Lindström, M, Sturkell, E.F.F. and Törnberg, R., 2001: "Lockne: A well-displayed marine-target crater in Central Scandinavia". 7th ESF-IMPACT Workshop "Submarine craters and ejecta-crater correlation", Longyearbyen, Svalbard, p. 87.

Other invited and/or public seminars

2007 Wetumpka Community Center, Alabama, USA.

Date: 6 March.

Title: Impact Cratering –Wetumpka in its Context.

Duration: 1h.

2006 Public Library of the Town of Östersund, Sweden

Date: 8 June.

Title: Locknekratern i ett Kosmiskt Perspektiv (In Swedish).

Duration: 1h.

2009 department of Geology, Auburn University, Alabama, USA.

Date: 29 October

Title: Marine-Target Impact Craters in the Field, Experiments, and Numerical Simulation..

- Duration: 1h.
 2012 Department of Earth Sciences, Gothenburg University, Sweden.
 Date: 2 March.
 Title: Cosmic Impact Cratering.
 Duration: 1h.
- 2012 Institute for Planetology, University of Münster, Germany
 Date: 21 May
 Title: Wet-Target Impact Craters Examined in the Field, in the Laboratory, and by Remote Sensing of Planetary Surfaces.
 Duration: 1h
- 2012 Leibniz Institute for Research on Evolution and Biodiversity, Natural History Museum, Berlin, Germany
 Date: 23 May
 Title: Wet-Target Impact Craters Examined in the Field, In the Laboratory, and by Remote Sensing of Planetary Surfaces.
 Duration: 1h
- 2014 Planetary Sciences and Remote Sensing Group, Institute of Geological Sciences, Freie Universität Berlin, Germany.
 Date: 6 February
 Title: Impact craters as a key to planetary (paleo)environments.
 Duration: 1h

Other attendance at conferences, workshops, or courses of relevance:

- 2007 Marine Impacts and Environmental Consequences - The Mjølner Scientific Drilling Project, Joint Workshop Announcement ICDP/ESF-Magellan Program in Longyearbyen, Svalbard, September 10 – 13.
- 2000 ESF Short Course on Impact Metamorphism, Nördlingen, Germany.
- 1999 Alpbach Summer School "Mars". Alpbach, Austria.
- 1998 IRSPS Short Course in Geochemical Evolution of the Solar System, Pescara, Italy.
- 1997 IRSPS Short Course in Planetary Geology, Pescara, Italy.
- 1996 ASA/ESA Alpbach Summer School "Mission to the Moon – Science of and from the Moon". Austria.
- 1993 ESF workshop on impact cratering and evolution of planet Earth - Nördlingen, Germany.
- 1993 Sediment 93 - Marburg, Germany.

Popular publications in English:

King, D. T., Jr., and **Ormö, J.**, 2007a, Wetumpka field forum – report of a successful field excursion: Impacts in the field, v. 3 (Summer 2007), p. 7-10. [Available on-line at

http://web.eps.utk.edu/ifsg_files/newsletter/Summer_2007.pdf]

Ormö, J., Rossi, A.P., and Komatsu, G., 2002: "The discovery of the Sirente crater field". *Tumblingstone* 18 (On-line journal of the Spaceguard Foundation).

<http://spaceguard.rm.iasf.cnr.it/tumblingstone/issues/num18/eng/main.htm>

McGuire, P.C., Diaz Martinez, E., **Ormö, J.O.** 2005: "Don AstrobioQuixote del Centro de Astrobiología: The Cyborg Astrobiologist Explores Spain: Results from Geological Field Missions at Rivas Vaciamadrid and Riba de Santiuste", *Explorer*, published by the SETI Institute.

Popular publications in other languages:

- Ormö, J.**, 2013: "Lockne och Malingen, världsunikt tvillingpar". Hackas Sockenkrönika 2013, Hackas Hembygdsförening. pp. 138-147.
- Ormö, J.**, and Josep Oriol Oms Llobet, J., 2013: "La formación de cráteres de impacto. Un proceso fundamental en el Sistema Solar Enseñanza de las ciencias de la tierra". Revista de la Asociación Española para la Enseñanza de las Ciencias de la Tierra, ISSN 1132-9157, Vol. 21, Nº. 3, 2013 (Ejemplar dedicado a: Meteoritos), p. 310-320
- Ormö, J.**, 2006: "När himlen faller ner över våra huvuden – Kosmiska nedslag under jordens historia", Populär Astronomi, No. 3, 8-13.
- Ormö, J.**, 2005: "Geologi hos våra grannar: Solsystemets uppkomst och planetärgeologisk forskning". Geologiskt Forum, Vol. 47, 10-17.
- Ormö, J.**, 2003: "Sirentekratern – en ny nedslagskrater", Populär Astronomi, No. 3, 16-19.
- Ormö, J.**, 1995: "Mount St. Helens - 15 år efter, eller: vikten av Pocket Gophers". Berg och Dalbladet, nr 2-3, 22-26.
- Ormö, J.**, 1994: "Nya idéer om Frankenberger Bucht kan leda till utökat samarbete´Stockholm-Marburg". Berg och Dalbladet, nr 3, 9-10.
- Ormö, J.**, and Sturkell, E.F.F., 1997: "Nordiskt-Baltiskt nätverk inom impaktgeologisk forskning börjar ta form". Berg och Dalbladet, nr 3-4, 25-30.
- Grahn, Y., and **Ormö, J.**, 2001: "Domo de Araguinha - Sydamerikas största astroblem". Geologiskt Forum, Vol. 29, 4-7.
- Martinez-Frias, J., and **Ormö, J.**, 2005: "Impactos Meteoríticos". Revista Española de Física, Vol. 19(2), 47-55.
- Diaz Martinez E., McGuire P.C., **Ormö J.O.**, 2005: "Ordenadores y algoritmos de visión: Un cibergeólogo para la exploración de Marte", Investigacion y Ciencia, section on 'Ciencia y sociedad' (pp. 35-36).

Public outreach and education

1. Main character in the National Geographic documentary "Fireball of Christ" describing the work on the proposed Sirente impact structure in Italy. Broadcasted during 2011.
2. Participation in the NASA education and outreach project "Mars for Earthlings" (see above).
3. Participation in the annual science fair of Madrid.
4. Scientific advisor for the Lockne Impact Crater Museum (Kratermuséet i Lockne, Geologihuset).

End CV of Jens Ormö