

# A.I. (Antonis) Vakis, PhD

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## Address

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## Positions

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1. Associate Professor in the *Mechanics and Tribology of Engineering Systems* Jun 2018-  
Tenured position in the Advanced Production Engineering (APE) group of the Engineering and Technology Institute Groningen (ENTEG), Faculty of Science and Engineering (FSE), University of Groningen (UG), Groningen, the Netherlands

*Research* Tribology, contact mechanics, advanced manufacturing, renewable energy, biomechanics

*Teaching* Design, coordination and teaching of 1 Master and 1 Bachelor course

*Supervision* 2 postdocs and 2 PhD students; 5 Master and 6 Bachelor students graduated

*Administration* Industrial Engineering and Management (IEM) Programme Committee (PC); Mechanical Engineering (ME) Master Programme Admissions Board
2. Co-founder / Vice-President of R&D at *Ocean Grazer B.V.* Jun 2018-  
Co-founder, management and advisory board member in a spin-off company of the Ocean Grazer project developing a novel hybrid renewable energy harvesting and storage device, Groningen, the Netherlands
3. Visiting Professor in *Computational Mechanics with Experience in MD* Sep 2017  
Guest expert in computational mechanics with experience in molecular dynamics hosted by Prof. M. Paggi in the Multi-Scale Analysis of Materials (MUSAM) lab of the IMT School for Advanced Studies Lucca, Lucca, Italy
4. Assistant Professor in *Advanced Production Engineering* Jan 2013-  
Tenure-track position in the Advanced Production Engineering (APE) group of the Engineering and Technology Institute Groningen (ENTEG): research on tribology, contact mechanics, advanced manufacturing, renewable energy and biomechanics; design, coordination and teaching of 1 Master and 1 Bachelor course; supervision of 3 postdocs and 3 PhD students; 1 PhD, 22 Master and 23 Bachelor students graduated; service in the Industrial Engineering and Management (IEM) Programme Committee (PC), Faculty of Science and Engineering, University of Groningen, Groningen, the Netherlands  
May 2018
5. Visiting Researcher Oct-Dec  
Preliminary molecular dynamics work in the group of Prof. D.N. Theodorou (non-contracted / unpaid position), Department of Materials Science and Engineering, School of Chemical Engineering, National Technical University of Athens (NTUA), Athens, Greece  
2012
6. Researcher Sep 2010-  
Research towards PhD as an FP7 Young Researchers of Cyprus Program (PENEK) scholar with Prof. C.N. Hadjicostis, Department of Electrical and Computer Engineering (ECE), University of Cyprus (UCy), Nicosia, Cyprus  
Aug 2012

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| 7.  | <u>Special Scientist</u><br>Equipment review and selection for the Controls Laboratory of Prof. C.N. Hadjicostis, Department of Electrical and Computer Engineering, University of Cyprus, Nicosia, Cyprus   | Jul-Aug<br>2010       |
| 8.  | <u>Teaching Fellow (Instructor)</u><br>Coordination, teaching and grading of required junior-level course Mechanical Design II, Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA  | Jan-Jun<br>2009       |
| 9.  | <u>Research Assistant</u><br>Research for PhD on nanoscale interface mechanics (Jun 2008-Dec 2011) with Prof. A.A. Polycarpou and MSc on biomechanics (Sep 2005-May 2008) with Prof. X. Zhang, Dept. of Mechanical Science and Engineering (MechSE), University of Illinois at Urbana-Champaign (Uillinois), Urbana, IL, USA | Sep 2005-<br>Dec 2011 |
| 10. | <u>Teaching Assistant</u><br>Teaching CAD/FEM computer labs and fluid laboratory labs, and grading for the Signal Processing course, Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA   | Sep 2005-<br>Dec 2010 |

## Education

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| 1. | <u>PhD in Mechanical Engineering</u><br>Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA<br><br><i>Dissertation</i> Nanoscale interface mechanics with application to magnetic storage (Advisor: Prof. A.A. Polycarpou) | Jun 2008-<br>Dec 2011 |
| 2. | <u>MSc in Mechanical Engineering</u><br>Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, USA<br><br><i>Thesis</i> Two-dimensional biomechanical analysis of the extremely fast strikes of trap-jaw ant mandibles            | Sep 2005-<br>May 2008 |
| 3. | <u>BSc in Mechanical Engineering (Summa Cum Laude)</u><br>Department of Mechanical and Industrial Engineering (MIE), New Jersey Institute of Technology (NJIT), Newark, NJ, USA<br><br><i>Senior Project</i> Bulk material transporter – Track-stair                                 | Sep 2002-<br>May 2005 |
| 4. | <u>Diploma of Technician Engineer in Mechanical Engineering</u><br>Mechanical and Marine Engineering Department, Higher Technical Institute (HTI), Nicosia, Cyprus<br><br><i>Diploma Project</i> Product visualization techniques with computers                                     | Sep 1997-<br>Jun 2000 |

## Awards

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### ***Grants, Fellowships and Scholarships***

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| 1. | <u>Visiting Professorship at IMT School for Advanced Studies Lucca: €2,890</u><br>Guest expert in computational mechanics with experience in molecular dynamics at the IMT School for Advanced Studies Lucca | Sep 2017 |
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2. ITEA3 VMAP Project: €323,200 (as Principal Investigator, PI) Sep 2017-  
Funding for a postdoctoral position to create interoperable definitions for virtual material models in Computer Aided Engineering (CAE), as part of a 32-member consortium for the ITEA3 proposal “VMAP: A new Interface Standard for Integrated Virtual Material Modelling in Manufacturing Industry” (sub-project budget: €646,400; total award: ~€16 million)  
Postdoc: *S. Solhjo*
3. Groningen Engineering Center (GEC) Workshop: €1,000 Jul 2017  
Funding for a GEC workshop to bring together consortium/network members and new experts on renewable energy for the Ocean Grazer project; in collaboration with Prof. B. Jayawardhana
4. Lorentz Workshop “Micro/Nanoscale Models for Tribology”: €28,530 Apr 2016-  
Feb 2017  
Funding provided by the Lorentz Center (€18,530), the Royal Netherlands Academy of Arts and Sciences (KNAW, €6,000), the Materials Innovation Institute (M2i, €2,000 secured by L. Nicola), the Groningen University Fund (GUF, €1,000) and Nanovea (€1,000) for a workshop Lorentz Center@Oort workshop held in Leiden, the Netherlands (30 Jan to 3 Feb 2017), co-organized with M. Ciavarella, A. Fasolino, L. Nicola, J. Scheibert and V.A. Yastrebov with the participation of some 60 leading European tribologists
5. Northern Netherlands: RoSF Project: €138,400 (as Principal Investigator, PI) Mar 2016-  
Funding for a PhD position on the bonding strength of metal-polymer interfaces shared with Prof. A.H. van den Boogaard of the University of Twente (UT), the Netherlands, as part of a consortium for the Region of Smart Factories project (sub-project budget: €285,000; total award: ~€21 million)  
PhD Student: *R. Toljaga*
6. zSpace for Enhanced 3D Image Application in Education: €28,400 Sep 2015  
Joint proposal with the University Medical Center Groningen (UMCG) to deploy a 3D desktop tool to enable the visualization of virtual prototypes for education (total award: ~€85,000)
7. Startup Grant at the University of Groningen: €50,000 Jan 2013  
Standard startup package offered to new tenure-track staff of the Faculty of Science and Engineering; the startup package also includes one 4-year PhD position (total award: ~€255,000)  
PhD Student: *S. Solhjo*
8. FP7 Young Researchers of Cyprus Program (PENEK): €69,980 Sep 2010-  
Aug 2012  
Grant funded by the European Commission (FP7) and administered by the Research Promotion Foundation (RPF) of Cyprus between the Universities of Illinois and Cyprus, designed to facilitate the integration of young researchers into European academia
9. Teaching Fellow Award at the University of Illinois: \$2,500 Jan-May  
2009  
Department of Mechanical Science and Engineering Alumni Association fellowship awarded to graduate students to independently teach a course as instructors for one semester
10. Fulbright Cyprus-America Scholarship Program (CASP): \$65,250 Sep 2002-  
May 2005  
Scholarship awarded to Cypriot citizens to study in the USA; used for Bachelor study at the New Jersey Institute of Technology

## Other Awards

1. Industrial Engineering and Management (IEM) Teacher of the Year Finalist Jun 2017  
Voted in the top 2 teachers of the IEM program for academic year 2016-17
2. Poster Award (3<sup>rd</sup> place) Oct 2011  
Student Poster Competition at International Joint Tribology Conference (IJTC), Los Angeles, CA, USA
3. Highest Cumulative GPA Award May 2005  
Department of Mechanical and Industrial Engineering, New Jersey Institute of Technology, Newark, NJ, USA
4. Senior Project Award May 2005  
Department of Mechanical and Industrial Engineering, New Jersey Institute of Technology, Newark, NJ, USA
5. Outstanding Student Scholarship Award May 2005  
American Society of Mechanical Engineers (ASME) North Jersey Section

## Patents

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1. Prins, W.A., van Rooij, M., A.I. Vakis & B. Jayawardhana, *Underwater energy storage system*, European patent application EP17206416.4, 11 December 2017

## Publications

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<b>Citation Report</b>	<b>Google Scholar</b>	<b>Scopus</b>
Citations	295	220
h-index	9	8

### Peer-Reviewed Journal Articles

1. Wei, Y., J.J. Barradas-Berglind, Z. Yu, M. van Rooij, W.A. Prins, B. Jayawardhana & A.I. Vakis, *Frequency-Domain Hydrodynamic Modelling of Dense and Sparse Arrays of Wave Energy Converters*, Renewable Energy (IF 4.357), Accepted
2. Barradas-Berglind, J.J., H.T. Dijkstra, Y. Wei, M. van Rooij, H. Meijer, W.A. Prins, A.I. Vakis & B. Jayawardhana, *Revenue maximization and storage utilization for the Ocean Grazer wave energy converter: a Sensitivity Analysis*, IET Renewable Power Generation (IF 2.635), DOI: 10.1049/iet-rpg.2018.5107
3. Vakis, A.I., V.A. Yastrebov, J. Scheibert, L. Nicola, D. Dini, C. Minfray, A. Almqvist, M. Paggi, S. Lee, G. Limbert, J.F. Molinari, G. Anciaux, S. Echeverri Restrepo, A. Papangelo, A. Cammarata, P. Nicolini, R. Aghababei, C. Putignano, S. Stupkiewicz, J. Lengiewicz, G. Costagliola, F. Bosia, R. Guarino, N.M. Pugno, G. Carbone, M.H. Müser & M. Ciavarella, *Modeling and Simulation in Tribology Across Scales: an Overview*, Tribology International (IF 2.903), 2018, 125(169-199), DOI: 10.1016/j.triboint.2018.02.005
4. Mokkaer, T., L.Q. Lu, P. van Rijn, A.I. Vakis & Y.T. Pei, *Crystal growth mechanism of calcium phosphate coatings on titanium by electrochemical deposition*, Surface and Coatings Technology (IF 2.589), 334, 2018, DOI: 10.1016/j.surfcoat.2017.12.011

5. Müser, M.H., W.B. Dapp, R. Bugnicourt, P. Sainsot, N. Lesaffre, T.A. Lubrecht, B.N.J. Persson, K. Harris, A. Bennett, K. Schulze, S. Rohde, P. Ifju, W. G. Sawyer, T. Angelini, H. Ashtari Esfahani, M. Kadkhodaei, S. Akbarzadeh, J.-J. Wu, G. Vorlauffer, A. Vernes, S. Solhjoo, [A.I. Vakis](#), R.L. Jackson, Y. Xu, J. Streater, A. Rostami, D. Dini, S. Medina, G. Carbone, F. Bottiglione, L. Afferrante, J. Monti, L. Pastewka, M.O. Robbins & J.A. Greenwood, *Meeting the Contact-Mechanics Challenge*, Tribology Letters (IF 1.891), 2017, 65(4), DOI: 10.1007/s11249-017-0900-2
6. Song, H., [A.I. Vakis](#), X. Liu & E. van der Giessen, *Statistical model of rough surface contact accounting for size dependent plasticity and asperity interaction*, Journal of the Mechanics and Physics of Solids (IF 4.255), 2017, 106, DOI: 10.1016/j.jmps.2017.05.014
7. Solhjoo, S. & [A.I. Vakis](#), *Surface roughness of gold substrates at the nanoscale: an atomistic simulation study*, Tribology International (IF 2.903), 2017, 115, DOI: 10.1016/j.triboint.2017.05.024
8. Wei, Y., J.J. Barradas-Berglind, M. van Rooij, W.A. Prins, B. Jayawardhana & [A.I. Vakis](#), *Investigating the Adaptability of the Multi-Pump Multi-Piston Power Take-Off System for a Novel Wave Energy Converter*, Renewable Energy (IF 4.357), 2017, 111, DOI: 10.1016/j.renene.2017.04.042
9. Solhjoo, S., [A.I. Vakis](#) & Y.T. Pei, *Two phenomenological models to predict the single peak flow stress curves up to the peak during hot deformation*, Mechanics of Materials (IF 2.651), 2017, 105, DOI: 10.1016/j.mechmat.2016.12.001
10. Solhjoo, S. & [A.I. Vakis](#), *Continuum mechanics at the atomic scale: Insights into non-adhesive contacts using molecular dynamics simulations*, Journal of Applied Physics (IF 2.068), 2016, 120(21), DOI: 10.1063/1.4967795
11. [Vakis, A.I.](#) & J.S. Anagnostopoulos, *Mechanical design and modeling of a single-piston pump for the novel power take-off system of a wave energy converter*, Renewable Energy (IF 4.357), 2016, 96(Part A), DOI:10.1016/j.renene.2016.04.076
12. Solhjoo, S. & [A.I. Vakis](#), *Definition and detection of contact in atomistic simulations*, Computational Materials Science (IF 2.292), 2015, 109, DOI:10.1016/j.commatsci.2015.07.026
13. Solhjoo, S. & [A.I. Vakis](#), *Single asperity nanocontacts: comparison between molecular dynamics simulations and continuum mechanics models*, Computational Materials Science (IF 2.292), 2015, 99, DOI:10.1016/j.commatsci.2014.12.010
14. Chowdhury, S., [A.I. Vakis](#) & A.A. Polycarpou, *Optimization of molecularly thin lubricant to improve bearing capacity at the head-disk interface*, Microsystem Technologies (IF 1.195), 2015, 21(7), DOI:10.1007/s00542-014-2364-8
15. [Vakis, A.I.](#), *Asperity interaction and substrate deformation in statistical summation models of contact between rough surfaces*, Journal of Applied Mechanics (IF 2.133), 2014, 81(4), DOI:10.1115/1.4025413 &  
Song, H., E. van der Giessen & [A.I. Vakis](#), *Erratum: Asperity Interaction and Substrate Deformation in Statistical Summation Models of Contact Between Rough Surfaces [Journal of Applied Mechanics, 2014, 81(4), pp. 041012]*, Journal of Applied Mechanics (IF 2.133), 2016, 83(8), DOI:10.1115/1.4033534
16. [Vakis, A.I.](#) & A.A. Polycarpou, *An advanced rough surface continuum-based contact and sliding model in the presence of molecularly thin lubricant*, Tribology Letters (IF 1.891), 2013, 49(1), DOI:10.1007/s11249-012-0060-3

17. Vakis, A.I. & A.A. Polycarpou, *Passive vibration absorption for extremely high density recording*, IEEE Transactions on Magnetics (IF 1.243), 2012, 48(11), DOI:10.1109/TMAG.2012.2195479
18. Vakis, A.I., C.N. Hadjicostis & A.A. Polycarpou, *Three-DOF dynamic model with lubricant contact for thermal fly-height control nanotechnology*, Journal of Physics D: Applied Physics (IF 2.588), 2012, 45(13), DOI:10.1088/0022-3727/45/13/135402
19. Vakis, A.I. & A.A. Polycarpou, *Modeling sliding contact of rough surfaces with molecularly thin lubricants*, Tribology Letters (IF 1.891), 2012, 45(1), DOI:10.1007/s11249-011-9863-x
20. Vakis, A.I., M. Eriten & A.A. Polycarpou, *Modeling bearing and shear forces in molecularly thin lubricants*, Tribology Letters (IF 1.891), 2011, 41(3), DOI:10.1007/s11249-010-9736-8
21. Vakis, A.I. & A.A. Polycarpou, *Head-disk interface nanotribology for Tbit/in<sup>2</sup> recording densities: near-contact and contact recording*, Journal of Physics D: Applied Physics (IF 2.588), 2010, 43(22), DOI:10.1088/0022-3727/43/22/225301
22. Vakis, A.I. & A.A. Polycarpou, *Optimization of thermal fly-height control slider geometry for Tbit/in<sup>2</sup> recording*, Microsystem Technologies (IF 1.195), 2010, 16(6), DOI:10.1007/s00542-010-1081-1
23. Vakis, A.I., S.-C. Lee & A.A. Polycarpou, *Dynamic head-disk interface instabilities with friction for light contact (surfing) recording*, IEEE Transactions on Magnetics (IF 1.243), 2009, 45(11), DOI:10.1109/TMAG.2009.2029410
24. Spagna, J.C., A.I. Vakis, C.A. Schmidt, S.N. Patek, X. Zhang, N.D. Tsutsui & A.V. Suarez, *Phylogeny, scaling, and the generation of extreme forces in trap-jaw ants*, Journal of Experimental Biology (IF 3.320), 2008, 211(14), DOI:10.1242/jeb.015263

### **Peer-Reviewed Conference Papers**

1. Tay, Z.Y., Y. Wei & A.I. Vakis, *Energy Extraction of Pontoon-Type Wave Energy Converter*, OMAE 2018, Madrid, Spain, 17-22 June 2018
2. Wang, R., Y. Wei, M. van Rooij, W.A. Prins, B. Jayawardhana & A.I. Vakis, *Influence of a taut cable on the performance of a point-absorber wave energy converter*, OMAE 2018, Madrid, Spain, 17-22 June 2018
3. Wei, Y., M.Z. Almuzakki, J.J. Barradas-Berglind, R. Wang, M. van Rooij, W.A. Prins, B. Jayawardhana & A.I. Vakis, *A Fourier approximation method for the Multi-Pump Multi-Piston Power Take-Off System*, OMAE 2018, Madrid, Spain, 17-22 June 2018
4. Almuzakki, M.Z., J.J. Barradas-Berglind, Y. Wei, M. Munoz-Arias, A.I. Vakis & B. Jayawardhana, *A port-Hamiltonian Approach to Cummins' Equation for Floater Arrays with Linear Power Take-Off Systems*, IFAC-LHMNC 2018, Valparaiso, Chile, 1-4 May 2018
5. Wei, Y., J.J. Barradas-Berglind, M. van Rooij, W.A. Prins, B. Jayawardhana & A.I. Vakis, *A Frequency-Domain Model for a Novel Wave Energy Converter*, EWTEC 2017, Cork, Ireland, 27 August-2 September 2017
6. Barradas-Berglind, J.J., M. Munoz-Arias, Y. Wei, W.A. Prins, A.I. Vakis & B. Jayawardhana, *Towards Ocean Grazer's Modular Power Take-Off System Modelling: a Port-Hamiltonian Approach*, IFAC 2017 World Congress, Toulouse, France, 9-14 July 2017 (Invited paper)

7. Dijkstra, H.T., J.J. Barradas-Berglind, H. Meijer, M. van Rooij, W.A. Prins, [A.I. Vakis](#) & B. Jayawardhana, *Revenue Optimization for the Ocean Grazer Wave Energy Converter through Storage Utilization*, RENEW 2016 Conference, Lisbon, Portugal, 24-28 October 2016
8. Barradas-Berglind, J.J., H. Meijer, M. van Rooij, S. Clemente Piñol, B. Galván Garcia, W.A. Prins, [A.I. Vakis](#) & B. Jayawardhana, *Energy Capture Optimization for an Adaptive Wave Energy Converter*, RENEW 2016 Conference, Lisbon, Portugal, 24-28 October 2016
9. Solhjoo, S. & [A.I. Vakis](#), *Molecular dynamics simulations of rough contact with fractal and statistical surface generation*, ASME 2014 12th Biennial Conference on Engineering Systems Design and Analysis (ESDA), Copenhagen, Denmark, 25-27 June 2014, DOI:10.1115/ESDA2014-20107
10. [Vakis, A.I.](#), H. Meijer & W.A. Prins, *First steps in the design and construction of the Ocean Grazer*, ASME 2014 12th Biennial Conference on Engineering Systems Design and Analysis (ESDA), Copenhagen, Denmark, 25-27 June 2014, DOI:10.1115/ESDA2014-20108
11. [Vakis, A.I.](#), S.-C. Lee & A.A. Polycarpou, *Dynamic contact with friction of an ultra-low flying head-disk interface with thermal protrusion*, Asia-Pacific Magnetic Recording Conference (APMRC), Singapore, 14-16 January 2009, DOI:10.1109/APMRC.2009.4925390

### **Conference (Extended) Abstracts**

1. Mokabber, T., P. van Rijn, [A.I. Vakis](#) & Y.T. Pei, *Adhesion of osteoblast-like cells on electrodeposited calcium phosphate coatings*, International Conference on Processing & Manufacturing of Advanced Materials: THERMEC 2018, Paris, France, 8-13 July 2018
2. Almuzakki, M.Z., J.J. Barradas-Berglind, Y. Wei, M. Munoz-Arias, [A.I. Vakis](#) & B. Jayawardhana, *Extending Cummins' Equation to Floater Arrays: a port-Hamiltonian Approach*, 37<sup>th</sup> Benelux Meeting on Systems and Control, Soesterberg, Netherlands, 27-29 March 2018
3. Song, H., [A.I. Vakis](#), X. Liu & E. van der Giessen, *From Discrete Dislocation Plasticity to a Statistical Model of Rough Surface Contact*, 2017 MRS Fall Meeting & Exhibit, Boston, MA, 26 November-1 December 2017
4. Brenes-Casasola, J., M. Muñoz-Arias, J.J. Barradas-Berglind, W.A. Prins, [A.I. Vakis](#) & B. Jayawardhana, *Energy Extraction Analysis of the Ocean Grazer WEC via Digital Particle Image Velocimetry*, 36<sup>th</sup> Benelux Meeting on Systems and Control, Spa, Belgium, 28-30 March 2017
5. Barradas-Berglind, J.J., M. Muñoz-Arias, Y. Wei, W.A. Prins, [A.I. Vakis](#) & B. Jayawardhana, *Energy-based Modeling of the Ocean Grazer Power Take-off System*, 36<sup>th</sup> Benelux Meeting on Systems and Control, Spa, Belgium, 28-30 March 2017
6. Mokabber, T., P. van Rijn, [A.I. Vakis](#) & Y.T. Pei, *Adhesion of cells on synthesized hydroxyapatite coatings with different morphologies*, Netherlands Society for Biomaterials and Tissue Engineering (NBTE) 25<sup>th</sup> Annual Meeting, Lunteren, the Netherlands, 1-2 December 2016
7. Solhjoo, S. & [A.I. Vakis](#), *The Area of Contact for Non-Adhesive Rough Surfaces: Comparison between MD and Persson's Model*, Multiscale Materials Modelling (MMM) 2016, Dijon, France, 9-14 October 2016
8. Solhjoo, S. & [A.I. Vakis](#), *Lubricated normal and sliding contact of fractal rough surfaces at the atomic scale*, COSTnanoTribo Conference, Istanbul, Turkey, 22-26 June 2015

9. van Rooij, M., H. Meijer, W.A. Prins & A.I. Vakis, *Experimental performance evaluation and validation of dynamical contact models of the Ocean Grazer*, MTS/IEEE Oceans15, Genoa, Italy, 18-21 May 2015, DOI:10.1109/OCEANS-Genova.2015.7271552
10. Solhjo, S. & A.I. Vakis, *Normal contacts of lubricated fractal rough surfaces at the atomic scale*, TriboUK 2015, Loughborough, UK, 16-17 April 2015
11. Vakis, A.I., M. Eriten & A.A. Polycarpou, *Molecularly thin lubricant layer contact model accounting for interfacial slip*, ASME/STLE International Joint Tribology Conference (IJTC), San Francisco, CA, 17-20 October 2010, DOI:10.1115/IJTC2010-41249
12. Vakis, A.I. & A.A. Polycarpou, *Nanoscale mechanics for extremely high density recording*, Hellenic Society for Theoretical and Applied Mechanics (HSTAM) International Congress on Mechanics, Limassol, Cyprus, 12-14 July 2010
13. Zhang, X., K. Li & A.I. Vakis, *Biological inspiration from dynamic modeling of human hand and trap-jaw ant mandible movements*, Journal of Biomechanics (IF 2.431), 2007, 40: p. S79, DOI:10.1016/S0021-9290(07)70076-3
14. Spagna, J.C., S.N. Patek, A.I. Vakis & A.V. Suarez, *Extreme forces and jaw size variation in trap-jaw ants*, Integrative and Comparable Biology, 2006, 46: p. E134-E134

### **Professional Articles**

1. Vakis, A.I. & A.A. Polycarpou, *Dynamic adhesive contact with molecularly thin lubricant at the head-disk interface of hard disk drives*, STLE's Official Membership Magazine, TLT (Tribology & Lubrication Technology), 2012 (Invited paper)

## **Presentations**

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### **Invited Talks**

1. *Ocean Grazer 3.0: A hybrid, modular and scalable renewable energy capture and storage device*, Ocean Energy Platform, Faculty of Mechanical, Maritime and Materials Engineering (3ME), Technical University Delft, Delft, the Netherlands, May 2018
2. *Research Overview and Future Outlook: Multiscale Tribology, Advanced Manufacturing and Renewable Energy Harvesting*, University of Cyprus, Nicosia, Cyprus, December 2017
3. *The Ocean Grazer Project: Hybrid Renewable Energy Extraction and Storage*, Joint NWO-MOST Seminar, National Cheng Kung University (NCKU), Tainan, Taiwan, November 2017
4. *Classical Molecular Dynamics as a Tool for Tribology and Beyond*, IMT School for Advanced Studies Lucca, Lucca, Italy, September 2017
5. *Ocean Grazer: a Novel Ocean Energy Extraction and Storage Device*, IMT School for Advanced Studies Lucca, Lucca, Italy, September 2017
6. *How education should look like in 2030*, Industrial Engineering and Management (IEM) First Year Symposium, Groningen, the Netherlands, June 2017
7. *Engineering the Ocean Grazer*, Industrial Engineering and Management (IEM) student association TBV Lugus-ENTEG meeting 2017, Groningen, the Netherlands, February 2017
8. *Advanced Production Engineering: Research overview and 3D printing roadmap*, Innovation Cluster Drachten (ICD), Drachten, the Netherlands, May 2016

9. *Tribology across scales as a bridge between science and engineering*, Engineering and Technology Institute Groningen Seminar Series, Faculty of Science and Engineering, University of Groningen, Groningen, the Netherlands, April 2015
10. *Design, analysis and optimization of the core technology for a novel wave energy converter*, Department of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus, January 2015
11. *Multi-scale tribology: from nanocontacts to wave energy harvesters*, Precision and Microsystems Engineering (PME) Department, Faculty of Mechanical, Maritime and Materials Engineering (3ME), Technical University Delft, Delft, the Netherlands, December 2014
12. *Modeling rough contact in the presence of molecularly thin lubricant films*, Department of Materials Science and Engineering, National Technical University of Athens, Athens, Greece, November 2012
13. *Multiscale interface mechanics and its applications*, Mechanical Engineering Department, Khalifa University, Abu Dhabi, UAE, September 2012
14. *Design and analysis of dynamical interfaces at the nanoscale*, Institute of Technology and Management, University of Groningen, Groningen, the Netherlands, June 2012
15. *Interface mechanics and dynamics in nanotechnology*, Mechanical Engineering Department, McGill University, Montreal, Canada, May 2012
16. *Passive vibration absorption for extremely high density recording*, Dynamics Interest Group (DIG) Seminar, Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, May 2012

### **Conference and Other Talks**

1. Presented by T. Mokabber: *Adhesion of osteoblast-like cells on electrodeposited calcium phosphate coatings*, THERMEC 2018, Paris, France, July 2018
2. Presented by Z.Y. Tay: *Energy Extraction of Pontoon-Type Wave Energy Converter*, OMAE 2018, Madrid, Spain, June 2018
3. Presented by Y. Wei: *Influence of a taut cable on the performance of a point-absorber wave energy converter*, OMAE 2018, Madrid, Spain, June 2018
4. Presented by Y. Wei: *A Fourier approximation method for the Multi-Pump Multi-Piston Power Take-Off System*, OMAE 2018, Madrid, Spain, June 2018
5. Presented by M.Z. Almuzakki: *A port-Hamiltonian Approach to Cummins' Equation for Floater Arrays with Linear Power Take-Off Systems*, IFAC-LHMNC 2018, Valparaiso, Chile, May 2018
6. Presented by M.Z. Almuzakki: *Extending Cummins' Equation to Floater Arrays: a port-Hamiltonian Approach*, 37<sup>th</sup> Benelux Meeting on Systems and Control, Soesterberg, Netherlands, March 2018
7. Presented by E. van der Giessen: *From Discrete Dislocation Plasticity to a Statistical Model of Rough Surface Contact*, 2017 MRS Fall Meeting & Exhibit, Boston, MA, November 2017
8. Presented by J.J. Barradas-Berglind: *Towards Ocean Grazer's Modular Power Take-Off System Modelling: a Port-Hamiltonian Approach*, IFAC 2017 World Congress, Toulouse, France, July 2017

9. Presented by J.J. Barradas-Berglind: *Energy Extraction Analysis of the Ocean Grazer WEC via Digital Particle Image Velocimetry*, 36th Benelux Meeting on Systems and Control, Spa, Belgium, March 2017
10. Presented by J.J. Barradas-Berglind: *Energy-based Modeling of the Ocean Grazer Power Take-off System*, 36th Benelux Meeting on Systems and Control, Spa, Belgium, March 2017
11. Presented by T. Mokabber: *Adhesion of cells on synthesized hydroxyapatite coatings with different morphologies*, NBTE Annual Meeting, Lunteren, the Netherlands, December 2016
12. Presented by J.J. Barradas-Berglind: *Revenue Optimization for the Ocean Grazer WEC through Storage Utilization*, RENEW 2016, Lisbon, Portugal, October 2016
13. Presented by J.J. Barradas-Berglind: *Energy Capture Optimization for an Adaptive Wave Energy Converter*, RENEW 2016, Lisbon, Portugal, October 2016
14. Presented by S. Solhjo: *The Area of Contact for Non-Adhesive Rough Surfaces: Comparison between MD and Persson's Model*, MMM 2016, Dijon, France, October 2016
15. Presented by S. Solhjo: *Nanotribology: Molecular Dynamics Simulation Approach*, ENTEG Autumn Meeting 2015, Haren, the Netherlands, October 2015
16. Presented by S. Solhjo: *Lubricated normal and sliding contact of fractal rough surfaces at the atomic scale*, COSTnanoTribo Conference, Istanbul, Turkey, June 2015
17. *Experimental performance evaluation and validation of dynamical contact models of the Ocean Grazer*, MTS/IEEE Oceans15, Genoa, Italy, May 2015
18. Presented by S. Solhjo: *Normal contacts of lubricated fractal rough surfaces at the atomic scale*, TriboUK 2015, Loughborough, UK, April 2015
19. *First steps in the design and construction of the Ocean Grazer*, ASME 2014 12th Biennial Conference on Engineering Systems Design and Analysis (ESDA), Copenhagen, Denmark, June 2014
20. *Molecular dynamics simulation of rough contact with fractal and statistical surface generation*, ASME 2014 12th Biennial Conference on Engineering Systems Design and Analysis (ESDA), Copenhagen, Denmark, June 2014
21. *Modeling asperity interaction*, DPTA/SMS group presentation, University of Groningen, Groningen, the Netherlands, May 2013
22. *Nanoscale modeling of hard disk drive design for ultrahigh recording densities* (as part of PENEK grant requirements), University of Cyprus, Nicosia, Cyprus, July 2012
23. *Sliding contact between rough surfaces in the presence of molecularly thin lubricant layers*, Surface Science and Technology, Department of Materials, ETH Zürich, Switzerland, December 2011
24. *Nanoscale interface mechanics with application to magnetic storage*, Institute of Robotics and Intelligent Systems (IRIS), ETH Zürich, Switzerland, December 2011
25. *Rough surface sliding contact in the presence of molecularly thin lubricant*, ASME/STLE International Joint Tribology Conference (IJTC), Los Angeles, CA, October 2011
26. *Molecularly thin lubricant layer contact model accounting for interfacial slip*, ASME/STLE International Joint Tribology Conference, San Francisco, CA, October 2010

27. *Modeling molecularly thin lubricant forces at the head-disk interface*, Information Storage Industry Consortium (INSIC) Annual Meeting, EHDR Program, Milpitas, CA, August 2010
28. *Tribodynamics of extremely high density recording*, Recruiting Presentation at the University of Illinois at Urbana-Champaign, Urbana, IL, March 2010
29. *Tbit/in<sup>2</sup> recording densities in magnetic storage: issues at the head-disk interface*, Nanohour Series at the Beckman Institute, University of Illinois at Urbana-Champaign, Urbana, IL, January 2010
30. *Optimization of TFC slider geometry and the effect of disk deformations due to air bearing stiffening during flight*, Information Storage Industry Consortium Annual Meeting, EHDR Program, Santa Clara, CA, August 2009
31. *Towards 10 Tbit/in<sup>2</sup> of storage density: optimization of HDD design with respect to TFC geometry for flying and surfing recording*, University of Cyprus, Nicosia, Cyprus, June 2009

### **Posters**

1. Presented by T. Mokabber: *Adhesion of osteoblast-like cells on electrodeposited calcium phosphate coatings*, THERMEC 2018, Paris, France, July 2018
2. Presented by T. Mokabber: *Crystal growth mechanism of calcium phosphate coatings on titanium by electrochemical deposition*, ENTEG Autumn Meeting 2017, Haren, the Netherlands, October 2017
3. Presented by R. Toljaga: *Multi-scale bonding strength of direct-joined polymer-metal interfaces*, ENTEG Autumn Meeting 2017, Haren, the Netherlands, October 2017
4. Presented by M.Z. Almuzakki: *Optimal Control of a Point Absorber Wave Energy Converter: A Fourier-Galerkin Approach*, ENTEG Autumn Meeting 2017, Haren, the Netherlands, October 2017
5. Presented by R. Wang: *On the dynamics of a taut cable and its PTO system*, ENTEG Autumn Meeting 2017, Haren, the Netherlands, October 2017
6. Presented by S. Solhjoo: *Atomic scale roughness of gold substrates*, Lorentz workshop on Micro/Nanoscale Models for Tribology, Leiden, then Netherlands, January 2017
7. Presented by S. Solhjoo: *Continuum contact mechanics theories at the atomic scale: an investigation of non-adhesive contacts*, Lorentz workshop on Micro/Nanoscale Models for Tribology, Leiden, then Netherlands, January 2017
8. Presented by J. Li: *Prediction of solubility for thermo-responsive comb polymers*, ENTEG Autumn Meeting 2016, Haren, the Netherlands, October 2016
9. Presented by T. Mokabber: *Synthesizing hydroxyapatite coatings for medical applications*, ENTEG Autumn Meeting 2016, Haren, the Netherlands, October 2016
10. Presented by S. Solhjoo: *Non-adhesive contacts: the application of continuum theories at the atomic scale*, ENTEG Autumn Meeting 2016, Haren, the Netherlands, October 2016
11. Presented by R. Toljaga: *Bonding strength of deforming metal-polymer interfaces*, ENTEG Autumn Meeting 2016, Haren, the Netherlands, October 2016
12. Presented by S. Solhjoo: *Nanotribology: Molecular Dynamics Simulation Approach*, ENTEG Autumn Meeting 2015, Haren, the Netherlands, October 2015

13. Presented by S. Solhjoo: Dry sliding contact between fractal and statistical rough surfaces at the atomic scale, FOM@Veldhoven, Veldhoven, the Netherlands, January 2015 & DGM European Symposium on Friction, Wear and Wear Protection, Karlsruhe, Germany, May 2014
14. *Passive vibration absorption for extremely high density recording*, IEEE International Magnetism Conference (INTERMAG), Vancouver, Canada, May 2012
15. *3-DOF model of magnetic storage head-disk interface for use with adhesive contact model with friction*, ASME/STLE International Joint Tribology Conference, Los Angeles, CA, October 2011
16. *Modeling molecularly thin lubricant forces in magnetic storage*, ASME/STLE International Joint Tribology Conference, San Francisco, CA, October 2010
17. *Assessment of dynamic contact conditions and optimization of TFC slider geometry for Tbit/in<sup>2</sup> recording densities*, ASME/STLE International Joint Tribology Conference, Memphis, TN, October 2009

## Teaching

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### **Master Courses**

1. Multiscale Contact Mechanics and Tribology (University of Groningen) Feb 2015-  
Designer, coordinator and lecturer of Advanced Production Engineering (APE) elective course for Industrial Engineering and Management (IEM)

### **Bachelor Courses**

1. Dynamics of Engineering Systems (University of Groningen) Apr 2019-  
Designer, coordinator and lecturer of compulsory 1<sup>st</sup> year course for IEM
2. Computer Aided Design and Manufacturing (University of Groningen) Nov 2013-  
Designer, coordinator and lecturer of compulsory 3<sup>rd</sup> year course for the IEM Jan 2018  
Production Technology and Logistics (PTL) track
3. Materials Science and Engineering (University of Groningen) Oct 2013-  
Lecturer of Finite Element Method (FEM) computer practicals of compulsory Oct 2017  
2<sup>nd</sup> year course for the IEM PTL track; course coordinator: Prof. B.J. Kooi
4. Mechanical Design II (University of Illinois at Urbana-Champaign) Jan-Jun  
Coordinator and lecturer of required junior-level course for the Mechanical 2009  
Science and Engineering program

## Supervision

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Industrial partners participating in PhD and Master projects include: *Philips Drachten, Tata Steel Ijmuiden, BD Kiestra, Leapfrog 3D Printers, Henkel Nederland B.V. and Fuji Electric Malaysia*

### **Postdoctoral Projects**

1. S. Solhjoo Oct 2017-  
*A new Interface Standard for Integrated Virtual Material Modelling in Manufacturing Industry*  
Postdoctoral project funded via RvO ITEA3 “VMAP” proposal

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|----|--|-----------|
| 2. | Y. Wei<br><i>Hydrodynamics of the Ocean Grazer</i><br>Postdoctoral project funded by the University of Groningen | Jun 2016- |
|----|--|-----------|

**Postdoctoral Project Co-supervision**

- |    |  |                       |
|----|--|-----------------------|
| 1. | J.J. Barradas-Berglind (Main supervisor: Prof. B. Jayawardhana)<br><i>Mechatronics of the Ocean Grazer</i><br>Postdoctoral project funded by the University of Groningen | Dec 2015-<br>Feb 2018 |
|----|--|-----------------------|

**PhD Projects**

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|----|---|-----------------------|
| 1. | R. Toljaga (Promotor: Prof. A.H. van den Boogaard, University of Twente)<br><i>Bonding strength of deforming metal-polymer interfaces</i><br>PhD project funded via SNN “Region of Smart Factories (RoSF)” proposal | Sep 2016-             |
| 2. | J. Li (Promotor: Prof. F. Picchioni)<br><i>Modeling of thermally reversible interactions in polymeric systems</i><br>PhD project funded by the Chinese Scholarship Council (CSC)                                    | Oct 2015-             |
| 3. | S. Solhjoo (Promotor: Prof. Y.T. Pei)<br><i>Nanotribology investigations with classical molecular dynamics</i><br>PhD project funded by the University of Groningen   | Sep 2013-<br>Jul 2017 |

**PhD Project Co-supervision**

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|----|--|-----------|
| 1. | M.Z. Almuzakki (Promotor: Prof. B. Jayawardhana)<br><i>Dynamical modeling and optimal distributed control design of the Ocean Grazer's floater blanket</i><br>PhD project funded by the Indonesia Endowment Fund for Education | Oct 2016- |
| 2. | T. Mokabber (Promotor: Prof. Y.T. Pei; co-promotor: Prof. P. van Rijn)<br><i>Synthesizing antibacterial hydroxyapatite coatings for medical applications</i>   | Oct 2015- |

**PhD Committee Participation**

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|----|---|----------|
| 1. | P.D. Druetta (Examining Committee; promotor: Prof. F. Picchioni)<br><i>To be decided</i>  | Oct 2018 |
| 2. | H. Song (Examining Committee; promotor: Prof. E. van der Giessen, ZIAM)<br><i>Size-dependent plasticity in contact/friction: from discrete dislocation dynamics inside an asperity to statistical summation over asperities</i> | Nov 2016 |

**Master Research Projects**

- |    |   |                       |
|----|---|-----------------------|
| 1. | F.C.M.P. Renzelmann<br><i>The effect of surface roughness on the bonding of a metal-polymer interface</i>   | Mar-Aug<br>2018       |
| 2. | J. Zantingh<br><i>Energy dissipation of the T-peel, end-notched-flexure and single-leg-bending tests</i>    | Mar-Aug<br>2018       |
| 3. | T. Koning<br><i>Studying, designing, creating and testing the bladder reservoir of the Ocean Grazer 3.0</i> | Mar-Aug<br>2018       |
| 4. | T. Herwig<br><i>A techno-financial analysis of the Ocean Grazer 3 concept</i>                               | Oct 2017-<br>Jun 2018 |

5. R.W. Verwoerd  
*Rotational motion transferring system for the Ocean Grazer concept 3.0* Oct 2017-  
Jun 2018
6. R.M. Zaharia  
*Understanding the Single-Piston Pump of the Ocean Grazer* Mar 2017-  
Jan 2018
7. J. Welink  
*The relationship between strip coating surface scratches and pot hardware  
dynamics in a continuous hot-dip galvanizing line* Jun 2017-  
Jan 2018
8. M. Kamps  
*Molecular dynamics simulation of polymeric flow on atomically flat and  
rough surfaces* Oct 2016-  
Jul 2017
9. A. van Driel  
*Development of the activation mechanism for the Ocean Grazer* Oct 2016-  
Jun 2017
10. R.J.M. Zwetsloot  
*Hydrodynamical analysis of the Ocean Grazer platform* Oct 2016-  
Jun 2017
11. Z. Yu  
*Hydrodynamic analysis of the floater blanket in the frequency domain* Oct 2016-  
Apr 2017
12. O.J. Strack van Schijndel  
*Visualization of mechanical constraints of the Antikythera Mechanism* Oct 2016-  
Apr 2017
13. P. Begemann  
*Validation of a simulation model for ductile fracture* Oct 2016-  
Apr 2017
14. J.N.B. Huisman  
*The effect of crystal structure on surface roughness at the nanoscale* Mar 2016-  
Feb 2017
15. O. van Hees  
*The design of a sealing system for the Ocean Grazer* Oct 2015-  
Jul 2016
16. M.R. Hegge  
*The redesign of the transportation track within the Total Lab Automation  
system of BD Kiestra* Sep 2015-  
Jul 2016
17. M.A. Hassink  
*Design of experimental measurements to obtain performance  
characteristics of a multiple ball check valve* Oct 2015-  
Jun 2016
18. P.J. Halbertsma  
*Free surface roughening due to multi-stage cold forming* Oct 2015-  
Apr 2016
19. H.J. Houtsma  
*Design of a station keeping system for the Ocean Grazer* Dec 2014-  
Dec 2015
20. R.W. de Groene  
*Friction experiments and simulations to model the hot forging process at  
Henkel Scheemda* Feb 2015-  
Sep 2015
21. D. ter Veen  
*Optimization of 3D printing for the APE group* Sep 2014-  
Jun 2015
22. L.J.P. Evers  
*Designing a transmission system for the Ocean Grazer* Sep 2014-  
May 2015

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|---|-----------------------|
| 23. A. Cruz Gispert (Erasmus)<br><i>Analysis and dynamical modeling of a piston valve for a wave energy converter</i>                           | Sep 2014-<br>Apr 2015 |
| 24. B. Ammerlaan<br><i>The effect of media substrate topography on the carbon coating coverage: a Molecular Dynamics study at Fuji Electric</i> | Jan 2014-<br>Mar 2015 |
| 25. M. van Rooij<br><i>Experimental validation of dynamical contact models of the Ocean Grazer</i>  | Mar 2014-<br>Feb 2015 |
| 26. H. Meijer<br><i>Simulation of a piston-type hydraulic pump for the Ocean Grazer</i>   | Sep 2013-<br>Dec 2014 |
| 27. E.J. Heslinga<br><i>Evaluating lubricant pick-up testing methods for media disks at Fuji Electric Malaysia</i>                              | Apr 2013-<br>Oct 2014 |

### **Master Research Project Co-supervision**

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|--|-----------------------|
| 1. P.A. Tjabbes (First supervisor: Prof. B. Jayawardhana)<br><i>Predictive maintenance: the feasibility of a non-straight knife edge sharpness deterioration model</i>                     | Oct 2017-<br>Jul 2018 |
| 2. P. Andela (First supervisor: Prof. Y.T. Pei)<br><i>Template-free synthesis of nanoporous Ni as binder-free current collectors for Li-ion batteries</i>                                  | Apr 2016-<br>Jun 2018 |
| 3. T.T. Abeln (First supervisor: Prof. Y.T. Pei)<br><i>Synthesis and application of three-dimensional Nanoporous Graphene–Carbon Nanotube Hybrid Structure in Lithium-Sulfur Batteries</i> | Oct 2016-<br>May 2018 |
| 4. B. Oosterwijk (First supervisor: Prof. Y.T. Pei)<br><i>Examination of influence factors on interlayer adhesion and layer resolution of 3D-printed soda-lime glass</i>                   | Oct 2017-<br>Apr 2018 |
| 5. W. Schlooz (First supervisor: Prof. B. Jayawardhana)<br><i>Early detection of lameness through motion sensors</i>   | Jun 2017-<br>Mar 2018 |
| 6. L. van Tilburg (First supervisor: Prof. Y.T. Pei)<br><i>Processing optimization and properties of fiber laser welded dual phase steel</i>   | Oct 2015-<br>Feb 2018 |
| 7. F. Zijlstra (First supervisor: Prof. Y.T. Pei)<br><i>Silver nanowire-based transparent conductive film</i>  | Apr 2016-<br>Dec 2017 |
| 8. G. Martí Manresa (Erasmus; first supervisor: Prof. B. Jayawardhana)<br><i>Analysis and comparison of wave energy extraction in the Ocean Grazer's wave tank experimental setup</i>      | Feb-Sep<br>2017       |
| 9. A. Fernández Vuelta (Erasmus; first supervisor: Prof. B. Jayawardhana)<br><i>Modular modelling for the Power Take-Off system of a Wave Energy Converter</i>                             | Feb-Sep<br>2017       |
| 10. A.S. Ratum (First supervisor: Prof. B. Jayawardhana)<br><i>Dynamical modeling and control of the Ocean Grazer WEC turbine subsystem</i>  | Oct 2016-<br>Jul 2017 |

11. P. Papangelos (First supervisor: Prof. B. Jayawardhana)  
*2D force measurement on a bicycle ergometer* Apr 2015-  
Jun 2017
12. W. van Zanten (First supervisor: dr. A.A. Geertsema)  
*The Antikythera Mechanism* Mar 2016-  
Apr 2017
13. N. Schriever (First supervisor: Prof. Y.T. Pei)  
*Nanoporous materials for sulfur-based cathodes of high-energy-density  
lithium-sulfur batteries* Mar 2016-  
Jan 2017
14. C. Verhoef (First supervisor: Prof. B. Jayawardhana)  
*Estimating and predicting the ocean surface with radar data* Oct 2015-  
Sep 2016
15. W. Wierenga (First supervisor: Prof. J. Post)  
*Evaluation of the MSC Adams co-simulation interface for metal working  
processes* Nov 2015-  
Jul 2016
16. H.T. Dijkstra (First supervisor: Prof. B. Jayawardhana)  
*Maximizing revenue of electricity generated by the Ocean Grazer* Oct 2015-  
Jul 2016
17. E. Heidstra (First supervisor: Prof. Y.T. Pei)  
*Improving the filament extrusion performance and reliability of the  
Leapfrog Creatr Pro 3D printer* Oct 2015-  
Apr 2016
18. S. Clemente Piñol (Erasmus; first supervisor: Prof. B. Jayawardhana)  
*Dynamical modeling, analysis and optimization of a floater blanket* Sep 2014-  
May 2015
19. D.A. Botterweg (First supervisor: Prof. Y.T. Pei)  
*The design of a check valve for the Ocean Grazer* Mar 2014-  
Feb 2015
20. B. Galván Garcia (Erasmus; first supervisor: Prof. B. Jayawardhana)  
*Nonlinear control design for a wave energy converter* Mar 2014-  
Aug 2014

**Other Master Projects (Business, Design, etc.)**

1. M. Kamps (IEM Design Project; first supervisor: dr. J.A.W.M. Vos)  
*Microstructure-based crystal plasticity modeling of macro-scale material  
characteristics using DAMASK* Sep 2017-  
Mar 2018
2. N.M. Looijenga (IEM Design Project; first supervisor: dr. A.A. Geertsema)  
*Improvement on material phase-in and phase-out to minimize deadstock or  
excess material in Besi APac* Oct 2017-  
Mar 2018
3. O.J. Strack van Schijndel (IEM Design Project; first s.: dr. A.A. Geertsema)  
*Designing a TEVAR delivery system* May-Nov  
2017
4. L. van Tilburg (IEM Design Project; first supervisor: dr. A.A. Geertsema)  
*The design of two new quantitative wrinkle measurement methods to  
measure during and after ironing* Dec 2016-  
Sep 2017
5. K. van Ek (Science, Business and Policy; first supervisor: dr. J. Kosinka, JBI)  
*Single-material 3D printed objects with varying flexibility* Feb 2017-  
Jul 2017
6. E.M. de Ruiter (IEM Design Project; first supervisor: dr. H. Kloosterman)  
*Improving the campaign life of the pot hardware in the continuous  
galvanizing lines at Tata Steel IJmuiden* Nov 2016-  
Mar 2017

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|----|---|-----------------------|
| 7. | J. Franke (Energy and Environmental Sciences; first supervisor: Prof. E.J. Stamhuis, ESRIG)<br><i>An experimental approach to create an efficient and non-clogging solid-liquid separation method using biomimetics</i> | Sep 2015-<br>Mar 2017 |
| 8. | B.J.D. Hallo (IEM Business Project)<br><i>Feasibility study of small-scale production of filament for 3D printing</i>   | May 2015-<br>Oct 2015 |

**Bachelor Projects**

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|-----|---|-----------------------|
| 1.  | S. van den Elzen<br><i>The Ocean Grazer: Designing a flexible underwater reservoir</i>  | Feb-Jun<br>2018       |
| 2.  | R.L. Folkertsma<br><i>Mathematical modeling of slamming in a single-piston pump inside the Ocean Grazer</i>   | Feb-Jun<br>2018       |
| 3.  | K. Paapst<br><i>Analyzing the experimental results of a single-piston pump</i>  | Feb-Jun<br>2018       |
| 4.  | J. Jonker<br><i>On the scaling effects of a single-piston pump</i>  | Feb-Jun<br>2018       |
| 5.  | L.Y. Hut<br><i>Investigating the dynamic behavior of a multi-piston pump</i>  | Feb-Jun<br>2018       |
| 6.  | R. Sterk<br><i>Optimizing the damping coefficient for a WEC array</i>   | Feb-Jun<br>2018       |
| 7.  | J.P. Besier<br><i>Mechanical modeling of the floater cable under hydrodynamic loads</i>   | Sep 2017-<br>Jan 2018 |
| 8.  | C.V.A. Hoogerbrugge<br><i>Investigating the effect of varying the distribution of damping coefficients inside a floater blanket on the power extraction for a novel WEC</i> | Sep 2017-<br>Jan 2018 |
| 9.  | M.T.V. Mohr<br><i>Calculation of power absorption from irregular waves by the floater blanket of the Ocean Grazer</i>   | Sep 2017-<br>Jan 2018 |
| 10. | R. Bos<br><i>The Ocean Grazer floater blanket as an inflatable mattress concept</i>   | Feb 2017-<br>Jun 2017 |
| 11. | A. Miocevic<br><i>Ocean Grazer: external platform structure</i>   | Feb 2017-<br>Jun 2017 |
| 12. | J.P. Nienhuis<br><i>Preliminary study on modelling interfacial behavior in a metal-polymer interface using COMSOL Multiphysics</i>  | Feb 2017-<br>Jun 2017 |
| 13. | N. de Vries<br><i>Interactive 3D models via Unity for education</i>   | Feb 2017-<br>Jun 2017 |
| 14. | J.E. Bos<br><i>The Antikythera mechanism – From the sea to 3D: Virtual Greek astronomy and engineering</i>  | Feb 2017-<br>Jun 2017 |
| 15. | M.J.J. Bögels<br><i>Validating floater blanket models for the Ocean Grazer</i>  | Sep 2016-<br>Jan 2017 |

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|-----|---|-----------------------|
| 16. | R.M. Nienhuis<br><i>The Antikythera mechanism: using the past to shape the future</i>             | Sep 2016-<br>Jan 2017 |
| 17. | S. Vreriks<br><i>Empirical research on multi-chamber Oscillating Water Columns</i>                | Feb 2016-<br>Jun 2016 |
| 18. | M.R.A. Visser<br><i>Wave tank experiments on the prototype of the floater blanket</i>             | Feb 2016-<br>Jun 2016 |
| 19. | P. van den Berg<br><i>Optimal turbine for a varying head and flow in the Ocean Grazer</i>         | Feb 2016-<br>Jun 2016 |
| 20. | R. Zaharia<br><i>Added value of an Oscillating Water Column</i>                                   | Sep 2015-<br>Jan 2016 |
| 21. | T. Herwig<br><i>Creating a structural design for the floater elements for the Ocean Grazer</i>    | Feb 2015-<br>Jun 2015 |
| 22. | N. Hartsuiker<br><i>Conversion of hydraulic head into electrical energy in the Ocean Grazer</i>   | Feb 2015-<br>Jun 2015 |
| 23. | O.J. Strack van Schijndel<br><i>Determining the amount of floater members of the Ocean Grazer</i> | Feb 2015-<br>Jun 2015 |
| 24. | J.S. van der Molen<br><i>Creating a better data management system for the Ocean Grazer group</i>  | Feb 2015-<br>Jun 2015 |
| 25. | W. van Zanter<br><i>Researching the floater-piston connection of the Ocean Grazer</i>             | Sep 2014-<br>Jan 2015 |
| 26. | M. Kamps<br><i>Validating a surface roughness model using FEM</i>                                 | Sep 2014-<br>Jan 2015 |
| 27. | J. Welink<br><i>Creating a scale model for the Ocean Grazer</i>                                   | Feb-Jul<br>2014       |
| 28. | W. Wierenga<br><i>Designing and testing a nonlinear energy sink applied to the Ocean Grazer</i>   | Feb-Jul<br>2014       |

### **Bachelor Project Co-supervision**

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|----|---|-----------------------|
| 1. | R. Popa (Astronomy; first supervisor: Prof. M.A.M. v.d. Weijgaert, Kapteyn)<br><i>Visualization of the Antikythera Mechanisms's Planetarium</i>           | Mar 2017-<br>Jul 2017 |
| 2. | F. Kernkamp (Applied Physics; first Supervisor: Prof. P. Onck, ZIAM)<br><i>Contact modelling of patterned liquid crystal polymer coatings</i>             | Aug 2015-<br>May 2016 |
| 3. | S. Gupta (Erasmus)<br><i>A feasibility study of the application of a piston ring system for the piston-type hydraulic pump system in the Ocean Grazer</i> | Aug-Dec<br>2015       |

### **Other**

#### **Membership in Professional Societies**

1. IEEE, the Institute of Electrical and Electronics Engineers
2. STLE, the Society of Tribologists and Lubrication Engineers

3. ASME, the American Society of Mechanical Engineers
4. ETEK, the Scientific and Technical Chamber of Cyprus
5. Tau Beta Pi (NJ Gamma), the National Engineering Honor Society
6. Pi Tau Sigma (Tau Theta), the International Mechanical Engineering Honor Society

### ***Academic Service***

1. Member of the new Mechanical Engineering master program's Admissions Board; participant in curriculum development activities since 2016 Sep 2018-
2. Co-organizer and co-chair with B. Jayawardhana and M. van Rooij of two-day "Ocean Grazer Workshop," where a roadmap for renewable energy research was discussed with academic partners of the Ocean Grazer project, held in Groningen, the Netherlands, on 23 and 27 March 2018 Mar 2018
3. Jury member for the Tournament in Management and Engineering Skills (TIMES) Semi Final, a case study competition organized by the European Students of Industrial Engineering and Management (ESTIEM) in Groningen, the Netherlands, from 12 to 16 February 2018 Feb 2018
4. Academic Advisor on mechanical engineering for the "Top Dutch Solar Racing" team participating in the Bridgestone World Solar Challenge 2019 Oct 2017-
5. Chair of Industrial Engineering and Management (IEM) Programme Committee (PC) at the University of Groningen Sep 2016-
6. Co-organizer and co-chair with M. Ciavarella, A. Fasolino, L. Nicola, J. Scheibert and V.A. Yastrebov of a Lorentz Workshop on "Micro/Nanoscale Models for Tribology" held in Leiden, the Netherlands, from 30 January to 3 February 2017 Apr 2016-  
Feb 2017
7. Member of Industrial Engineering and Management (IEM) Programme Committee's Evaluation Committee (EC) at the University of Groningen Sep 2014-  
Jul 2016
8. Teacher of workshop on Computer Aided Design for Cover, the Student Association of Computing Science and Artificial Intelligence at University of Groningen Sep 2014
9. Co-organizer and co-administrator (with Drs. W.A. Prins) of the Ocean Grazer Group comprising staff members and students working on the Ocean Grazer project at the University of Groningen Sep 2014-
10. Reviewer for the National Research Foundation of South Africa Aug 2014
11. Supervisor of student groups performing literature research for Industrial Engineering and Management Integrated Design Project, a compulsory 1<sup>st</sup> year course in the IEM Production Technology and Logistics (PTL) track Apr 2014
12. Member of Industrial Engineering and Management (IEM) Programme Committee (PC) at the University of Groningen Sep 2013-  
Jul 2016
13. Organizer of seminar series on magnetic storage tribology at the Electrical and Computer Engineering Department of the University of Cyprus as part of the requirements for the PENEK grant Jun 2012

14. Reviewer for a number of journals in the fields of:

Sep 2009-

- › *Tribology and lubrication* (Tribology International, Tribology Letters, Journal of Tribology, Journal of Engineering Tribology, Tribology Transactions);
- › *Applied mechanics, materials science and applied physics* (Journal of Applied Mechanics, Meccanica, Computational Materials Science, International Journal of Solids and Structures, Journal of Adhesion Science and Technology, Journal of Applied Physics, EPL/Europhysics Letters);
- › *Manufacturing and mechanical engineering* (Journal of Cleaner Production, Journal of Micro- and Nano-Manufacturing, International Journal of Precision Engineering and Manufacturing-Green Technology, Journal of Hydraulic Engineering); and
- › *Renewable energy* (Renewable and Sustainable Energy Reviews, Applied Energy, Ocean Engineering)