

CV

1. PERSONAL DATA

Name: Matteo Chiesa
Date of birth: 24th December 1974
Nationality: Norwegian
Gender: Male
Position: Associate Professor
Company: [Masdar Institute of Science and technology](#)¹
P.O. Box 54224, Abu Dhabi UAE
Telephone: + 971 56 601 8336 (M)
+971 2 698 8167 (O)

2. EDUCATION

1997 – 2001 PhD in Applied Mechanics², Norwegian University of Science and Technology ([NTNU](#)), Department of Mechanical Engineering ([Prof. B. Skallerud](#) and [Prof. C. Thaulow](#))

1992 – 1997 Master in Mechanical Engineer (MSc)³, The Norwegian University of Science and Technology ([NTNU](#)), Department of Mechanical Engineering, ([Prof. B. Skallerud](#))

3. PROFESSIONAL EXPERIENCE

My professional development is characterized by a combination of industrial and academic experiences within the energy domain.

2011 – (ongoing) **Associate Professor** at the [Masdar Institute](#) (MI) and head of the [LENS](#) (Laboratory for Energy and Nano-Science). The research in my group focuses on the creation and the establishment of technologies necessary to adapt the current energy system into a more sustainable, competitive and secure one. In particular the use of properly designed nano-materials can lead to impressive device performance if one understands and is able to control the interplay between material properties at the nanoscale, structural features and

¹ The Masdar Institute is a private, not-for-profit, independent, research-driven institute developed with the support and cooperation of the Massachusetts Institute of Technology (MIT). The faculty has been chosen by MIT to guarantee its academic standard.

² PhD thesis: "Linking advanced fracture model to structural analysis"

³ Master thesis: "Numerical analysis of ductile damage with a micro-mechanically based material model: consideration of a mixed mode fracture and length scales "

manufacturing processes in order to properly design low energy system.

- 2007 – 2010** **Assistant Professor** at the [Masdar Institute](#) with a joined appointment within the Program of Mechanical Engineering and Material Science. The research in my group focused on energy transport, conversion, and storage, and on the application of nanotechnology towards the development of novel power generation devices and/or systems based on renewable energy sources.
- 2007 – 2008** **Visiting Scholar** at [MIT](#) in the Department of Mechanical Engineering, [Nanoengineering group](#) of Prof. Chen. I was involved in a project that aimed at developing high-performance [STEG](#) (Solar Thermoelectric Energy Converter) device. The STEG uses wavelength-selective absorbers, a vacuum enclosure, and high-ZT thermoelectric materials to maximize efficiency.
- 2006 – 2007** **Post Doc. Fellow** at [MIT](#), Department of Mechanical Engineering, [Nanoengineering group](#). My research focused on the investigation of thermal transport over length scales from nanometers upward in solids and liquids.
- 2005 – 2010** **Technical Advisor R&D**, [Hamworthy](#) (former Aibel and ABB Offshore Systems). I was involved in the development of a novel process philosophy for the separation of oil and water within a single stage separation train. The work was mainly carried out while working in Billingstad for Aibel from 2005 to 2006. Since September 2006 I served as a Senior Technical Advisor while I was employed at MIT in Boston.
- 2002 – 2005** **Research Scientist**, [SINTEF Petroleum and Energy](#), Trondheim, Dept. Energy Processes. I developed and managed tasks of various R&D projects within the energy field. The projects I have been involved range from *Environmental friendly power from coal fired power plant* to *Development of an impulsive source element for marine seismic surveying* to *Gas liquefaction and transportation* and *Water and Oil separation by means of electric field*. The list represents just few of the projects I was involved with.
- 1998 – 2002** **Research Fellow** at [Sintef Materials & Chemistry](#), [Applied Mechanics and Corrosion](#). My investigation focused on *Linking advanced fracture model to structural analysis*⁴, it has lead to my PhD degree at [NTNU](#). The work was financed by Statoil AS and the Norwegian Research Council.
- 1997 – 1998** **Project engineer** in [WesternGeco \(Schlumberger\)](#). I was involved with the mechanical design and installation of a new family of seismic equipments that allow for highly predictable and reliable seismic source necessary for ultra-deep petroleum exploration.
- 1992 – 1995** **Worker** at [LVF srl](#) where I worked in both the Manufacturing and Material Testing department.

⁴ PhD thesis: "Linking advanced fracture model to structural analysis" see: "Appendix A1"

4. HONORS / AWARDS

- Nanotech. Highlights 2011** A figure from the paper "How localized are energy dissipation processes in nanoscale interactions?" J49, is featured and has made front cover for the [Nanotechnology Highlights 2011 issue](#).
- ENI Award:** Selected to participate at the 2010 and 2011 edition of the [Eni Award](#)⁵. The award was officially established in July 2007 in order to develop innovative ideas for a better use of energy sources, promote environmental research and to valorize new generations of researchers.
- Stålmat – Dr. ing. Program** I was awarded a 4 year fellowship from Statoil for the fulfillment of my research that aimed at taking into account for the most critical failure modes and material behavior within a full scale structural analysis.

5. RESEARCH

Growing global demand for energy to power economic development and growth requires the development of cost-effective technologies for a more sustainable energy economy for any country to ensure that the local industry can compete successfully on the global scale. Research aiming at the creation and establishment of the technologies necessary to adapt the current energy system into a more sustainable, competitive and secure one requires a deep understanding of the energy sector. Research within the energy requires a multi disciplinary approach that implies a serious effort in bridging the gap between different engineering disciplines and moreover in connecting science and technology. The common denominator of the research I have been carrying out during my entire carrier is, in one or another form related to the energy domain and it spans from the oil and gas sector to the solar industry. Having worked for both academic institutions as much as for enterprises is a clear advantage.

Since 2008 my research is carried out at the [Laboratory for Energy & Nano Science \(LENS\)](#) a newly established laboratory belonging jointly to the programs of Mechanical Engineering and Material Science at MIST. The research at LENS focuses on energy transport, conversion, and storage, and on the application of nanotechnology towards the development of novel power generation devices and/or systems based on renewable energy sources. This research focuses on the understanding of the interplay between material properties, structural features at the nanoscale and manufacturing processes in order to properly design low energy system as illustrated in the figure on the right. See attached [Research Philosophy and Academic Achievements.pdf](#).

⁵ http://www.eni.com/en_IT/innovation-technology/eni-award/eni-award.shtml

Interests: Thermodynamics & Kinetics of Material
Nanoscale energy transfer and dissipation mechanism
Surface Science
Material challenges within Concentrated Solar Power devices

5.1 Funding

- 2012 – 2015** *PREDISOL Prediction of Solar Energy Distribution* (270 KUS\$) Funded by [Total](#). PI M. Chiesa
- 2012 – 2013** *Hybrid Spectral Beam Splitting Approach in concentrating solar thermal photovoltaic application* (100 KUS\$). Internally funded by Masdar Institute. Co-PI M.Chiesa.
- 2012 – 2013** *Dust Accumulation: Developing Functional Material for the Solar Industry* (200 KUS\$). Funded by [Siemens](#) Aerospace. PI M. Chiesa
- 2012 – 2013** *Modeling and Optimization of Combustion Assisted Thermal Spray Processes* (80 KUS\$). Funded by [Mubadala](#) Aerospace (80 KUS\$). Co-PI M. Chiesa.
- 2012 – 2013** *Understanding Interfacial Thermal Transport in Thermoelectric Energy Conversion Materials* (100 KUS\$). Internally funded by Masdar Institute. PI M.Chiesa
- 2012 – 2013** *On Chip Solid State Cooling for Low Power IC Device* (100 KUS\$). Internally funded by Masdar Institute. PI M.Chiesa.
- 2012 – 2013** *Aerosol effect on solar radiation flux: consequences for solar thermal power production in the UAE* (200 KUS\$). Internally funded by Masdar Institute. Co-PI M.Chiesa
- 2011 – 2012** *Understanding Urban Heat Island Effect, Land-use and Climate Interactions: A Case Study of the Abu Dhabi Metropolitan Region* (100 KUS\$). Internally funded by Masdar Institute. Co-PI M.Chiesa
- 2011 – 2012** *Thermal concentration capability of a beam down CSP system*. Funded by [MSE](#) (1000 KUS\$). PI M. Chiesa.
- 2010 – 2012** *Solar Thermoelectric Energy Conversion: fundamentals and Application* (320 KUS\$). Internally funded by Masdar Institute in collaboration with MIT. PI M. Chiesa (MI) and Prof. G. Chen (MIT)
- 2010 – 2011** *Towards high-performance Thermo-photovoltaic cells* (320 KUS\$). Internally funded by Masdar Institute in collaboration with MIT. PI M. Chiesa (MI) and Prof. L.C. Kimerling and Dr. J. Michel (MIT)

- 2010 – 2011** *Hot climate mileage accumulation test* (90 KUS\$). Funded by Think AS. PI M. Chiesa (MI).
- 2006 – 2008** *Heat transferability of Nanofluids* (450 KUS\$). Funded by the [Norwegian Research Council \(NFR\)](#). PI M. Chiesa.
- 2002 – 2005** *Electrocoalescence* (1 300 KUS\$). Funded by [ABB](#), [Statoil](#), [BP](#), [Chevron](#) and the [Norwegian Research Council \(NFR\)](#). Co-PI M. Chiesa.
- 2003 – 2005** *Development of an impulsive source element for increased bandwidth that also reduces environmental impact for marine seismic surveying.* (2 000 KUS\$). Funded by [Schlumberger](#) and the [Norwegian Research Council \(NFR\)](#). PI M. Chiesa.
- 2004** *Environmental friendly power from coal fired power plant on Svalbard.* Funded by **Store Norske Spitsbergen Kulkompani** PI M. Chiesa.

5.2 Graduate’s advisor

Graduate students at [NTNU](#)

Since the end of my Doctoral degree while working at [SINTEF](#) I have co- advised several MSc candidates and two PhD candidates at the Norwegian University of Science and Technology. In total the number of people I have advised or co-advised is:

Number of MSc Thesis Degrees Awarded	16
Number of PhD Degrees Awarded	2
Number of Postdoctoral Students Supervised	5
Number of MSc committees	16
Number of PhD committees	8

Graduate students at Masdar Institute

<http://www.lens-online.org/people/>

* Main advisor

** Co-advisor

2012– 2016 PhD. candidate Faisal Al Marzooqi**
 Topic of Research: “**Application of nanomaterials in water desalination and devices fabrication**” IDDP Program, MIST. <http://www.lens-online.org/people/phds/72-meet-faisal>

2012– 2016 PhD. candidate Ahmed Zayan**
 Topic of Research: “**Solar Spectral Splitting in Parallel Multi-junction Systems**” IDDP Program, MIST. <http://www.lens-online.org/people/phds/40-meet-ahmed>

- 2012– 2016** PhD. candidate Carlo Maragliano**
Topic of Research: “**Thin film-based devices: from realistic simulations to nanoscale characterization using atomic force microscopy**” IDDP Program, MIST. <http://www.lens-online.org/people/phds/74-meet-carlo-alberto>
- 2012– 2016** PhD. candidate Carlo Amadei*
Topic of Research: “**Wetting behavior at the Nanoscale and the effect on hysteretic energy dissipation**” IDDP Program, MIST. <http://www.lens-online.org/people/phds/74-meet-carlo-alberto>
- 2012– 2016** PhD candidate Guang Li*
Topic of Research: “**Thermal and electrical transport in nanostructure thermoelectric materials**” IDDP Program, MIST.. <http://www.lens-online.org/people/graduate/41-meet-li>
- 2012– 2014** MSc. Candidate: Tzu Chieh Tang*
Topic of Research: “Hydrophilicity/hydrophobicity in biomolecules and biosystems” MSE Program, MIST. <http://www.lens-online.org/people/graduate/73-meet-zijay>
- 2012– 2014** MSc. Candidate: Ayoub Glia
Topic of Research: “**Interpretation of tip geometry in means of grasping better understanding of tip-sample interactions, hydrophobicity/hydrophilicity**” MSE Program, MIST. <http://www.lens-online.org/people/graduate/77-meet-ayoub>
- 2012– 2014** MSc. Candidate: Daan Heskes
Topic of Research: “**Functional surfaces and coatings for anti-icing applications**”MSE Program, MIST. <http://www.lens-online.org/people/graduate/79-meet-daan>
- 2012– 2014** MSc. Candidate: Rashed Ali Al Tayyari
Topic of Research: “**Nano-scale Characterization of Forensic Evidence (i.e. bones, blood, drugs) through the use of Atomic Force Microscopy and Electrons Microscopy**” MSE Program, MIST. <http://www.lens-online.org/people/graduate/76-meet-rashed>
- 2011 – 2015** PhD. candidate Karim Raafat Mahoud Gad Elrab*
Topic of Research: “**MEMS based low energy memory device**” IDDP Program, MIST. <http://www.lens-online.org/people/phds/34-meet-karim>
- 2011 – 2015** PhD. candidate Mr. Amro Al Khatib**
Topic of Research: “**Electrical and mechanical characterization of thin films for PV application**” IDDP Program, MIST. <http://www.lens-online.org/people/phds/49-meet-amro>
- 2011 – 2015** PhD. candidate Khalid Al Ali**
Topic of Research: “**Solar Assisted Reforming of CH₄ for H₂ production**” TITech (Chemical Engineering) <http://www.lens-online.org/people/phds/78-meet-khalid>

- 2011 – 2013** MSc. Mahfuzur Rahman** Graduated in 2013
Topic of Research: **“Synthesis and Optimization of Dispersion Conditions of Single-walled Carbon Nanotubes (SWCNTs) for Photovoltaic Application”** MSE Program, MIST. <http://www.lens-online.org/people/graduate/59-meet-mahfuzur>
- 2011 – 2013** MSc. Christopher Benedikt Pilcheur* Graduated in 2013
Topic of Research: **“Functional coatings for self-cleaning surfaces”** MSE Program, MIST. <http://www.lens-online.org/people/graduate/58-meet-benedikt>
- 2011 – 2013** MSc. Christopher Benedikt Pilcheur** Graduated in 2013
Topic of Research: **“Nanoscale Light Trapping for Improving PV Efficiency”** MSE Program, MIST. <http://www.lens-online.org/people/graduate/60-meet-adam>
- 2007 – 2013** PhD. candidate Daniel Kraemer** Graduated in 2013
Topic of Research: **“Solar Thermoelectric Generators”** MIT (Mechanical Engineering).
- 2010 – 2012** MSc. Guang Li* Graduated in 2012
Topic of Research: **“Thermal and electrical transport in nanostructure thermoelectric materials”** ME Program, MIST. <http://www.lens-online.org/people/graduate/41-meet-li>
Guang Li’s thesis was selected for the best thesis award in the MSE program.
- 2010 – 2012** MSc. Candidate: Mohamad Hadi Salam*
Topic of Research: **“Phonon and Electron Transport modeling in nanostructure thermoelectric materials”** ME Program, MIST. <http://www.lens-online.org/people/graduate/53-meet-hadi>
- 2010 – 2012** MSc. Ahmed Zayan** Graduated in 2012
Topic of Research: **“Solar Spectral Splitting in Parallel Multi-junction Systems”** ME Program, MIST. <http://www.lens-online.org/people/graduate/40-meet-ahmed>
- 2010 – 2012** MSc. Candidate: Ayman Z. Rizk** Graduated in 2012
Topic of Research: **“Research interest: Ultra-low power microprocessors”** MES Program, MIST. <http://www.lens-online.org/people/graduate/32-meet-ayman>
- 2010 – 2012** MSc. Candidate: Ragini Kalapatapu** Graduated in 2012
Topic of Research: **“Measurement and analysis of solar radiation angular distribution with sunshape profiling irradiator”** MES Program, MIST. <http://www.lens-online.org/people/graduate/57-meet-ragini>
- 2010 – 2012** MSc. Candidate: Yehia Eissa** Graduated in 2012
Topic of Research: **“Developed a tool to measure solar radiation over the UAE using SEVIRI data”** MES Program, MIST.
- 2010 – 2012** MSc. Candidate: Jamie Elizabeth Hutchins** Graduated in 2012
Topic of Research: **“Geothermal Utilization of Petroleum Wells”** MES Program, MIST. <http://www.lens-online.org/people/graduate/38-meet-yehia>

- 2009 – 2011** MSc. Marwan M. Mokhtar* Graduated in 2011
Topic of Research: “**Modeling framework for central receiver solar thermal power plants**” ME Program, MIST. <http://www.lens-online.org/people/alumni/50-meet-marwan>
- 2009 – 2011** MSc. Irene Rubalcaba Montserrat* Graduated in 2011
Topic of Research: “**Heat storage for solar thermal power application**” ME Program, MIST. <http://www.lens-online.org/people/alumni/35-meet-irene>
- 2009 – 2011** MSc. Karim Raafat Mahoud Gad Elrab* Graduated in 2011
Topic of Research: “**Destructive vs. non-destructive method for the characterization of mechanical properties of thin films for TPV applications**” MSE (Material Science and Engineering) Program MIST. <http://www.lens-online.org/people/phds/34-meet-karim>
- 2009 – 2011** MSc. Amro Al Khatib* Graduated in 2011
Topic of Research: “**Electrical and mechanical characterization of thin films for PV application**” MSE Program, MIST. <http://www.lens-online.org/people/phds/49-meet-amro>
- 2009 – 2011** MSc. Zaid M. Tahboub* Graduated in 2011
Topic of Research: “**Surface treatment for the minimization of soiling caused effect in PV cells**” MSE Program, MIST. <http://www.lens-online.org/people/alumni/39-meet-zaid>
- 2009 – 2011** MSc. Steve Mayers** Graduated in 2011
Topic of Research: “**Solar thermal cogeneration power with energy storage for based load grid**” MSE Program, MIST. <http://www.lens-online.org/people/alumni/33-meet-steven>
- 2009 – 2011** MSc. candidate: Waka Tesfai** Graduated in 2011
Topic of Research: “**The Effects of Dielectrophoretically Assembled Nano-Particles on Heat Transfer of Nanofluids**” MSE Program, MIST.
- 2009 – 2011** MSc. Salim Masharqa** Graduated in 2011
Topic of Research: “**Characterization of Deilectrophoretically Assembled Nanoparticles in Suspensions**” ME Program, MIST.
- 2009 – 2011** MSc. Candidate: Khalid Al Ali** Graduated in 2012 from TiTech
Topic of Research: “**Heat Transfer Fluid for Concentrated Solar Power Technology**”
- 2009 – 2011** MSc. Candidate: Ali Husain Masabi** Graduated in 2011 from TiTech
Topic of Research: “**Heat Transfer Fluid for Concentrated Solar Power Technology**”

5.3 List of Publications

5.3.1 Patents. Patents Applications

- P1. M. Stefancich, Adam Silvernail, Matteo Chiesa and Marcus Dahlem, "Autotracking optical solar concentrator system.," M I Invention Disclosure, ed. (2012).
- P2. M. Stefancich, Peter Armstrong and Matteo Chiesa, "Multichannel Optical power switch," MI Invention Disclosure, ed. (2012).
- P3. M. Chiesa, S. Santos, K. R. Gadelrab, T. Souier and M. Stefancich *"Framework for the quantification of nanoscale dissipative coefficients"* Invention Disclosure 13-11 Masdar Institute July 2011
- P4. M. Chiesa, S. Santos and M. Stefancich *"In-situ quantification of the Hamaker constant of single nano-scale feature"* Invention Disclosure 12-11 Masdar Institute July 2011
- P5. P. Armstrong, A. Qadir and M. Chiesa *"Liquid Air Transpired Solar Collector"* Invention Disclosure Masdar Institute April 2011
- P6. P. Armstrong, R. Kalapatapu and M. Chiesa *"Slit-optics, polar-axis shadowband radiometer and method for its use in mapping circumsolar radiation"* Invention Disclosure Masdar Institute March 2011
- P7. L. Hu, G. Chen, X. Chen and M. Chiesa *"Sub – Wavelength Metallic Cone Structures as Selective Solar Absorber"* Utility Application (Serial No. 61/119) December 3, 2008
- P8. L. Hu, G. Chen, X. Chen and M. Chiesa *"Sub – Wavelength Metallic Cone Structures as Selective Solar Absorber"* MIT Case No. 13410 (2008) L. Hu, G. Chen, X. Chen and M. Chiesa *"Sub – Wavelength Metallic Cone Structures as Selective Solar Absorber"* MIT Case No. 13410 (2008)
- P9. L. Hu, G. Chen, X. Chen and M. Chiesa *"Sub – Wavelength Metallic Cone Structures as Selective Solar Absorber"* MIT Case No. 13410 (2008) L. Hu, G. Chen, X. Chen and M. Chiesa *"Sub – Wavelength Metallic Cone Structures as Selective Solar Absorber"* **Patent record available from the World Intellectual Property Organization (WIPO) (2010)**
- P10. Anurag Bajpayee, Vincent Berube, Matteo Chiesa, Daniel Kraemer and Andrew Jerome. Muto *"Method for Recovery of Bitumen from Oil Sand: An Environmentally Friendly and Energy Efficient Alternative to Conventional Oil Recovery of Unconventional Oil Reserves"*, Provisional Patent 200813183 (2009)
- P11. Pål Jahre Nilsen and Matteo Chiesa *"A separator apparatus and a separating method: Inline system for separation of phases"*. **Patent application number at Oslo Patentkontor AS: 6231 (2005)**
- P12. Pål Jahre Nilsen and Matteo Chiesa *"A separator apparatus and a separating method: Inline system for separation of phases"*. **Patent record available from the UK Patent Office (2010)**

- P13. Pål Jahre Nilsen and Matteo Chiesa “A separator apparatus and a separating method: Inline system for separation of phases”. **Patent record available from the World Intellectual Property Organization (WIPO) (2007)**
- P14. Pål Jahre Nilsen, Matteo Chiesa, Peder Hansson and Helge Lie Andersen “A fluid treatment tank and a well fluid processing system comprising such a tank: Combined LP tank”. **Patent application number at Oslo Patentkontor AS: 1206 (2006)**
- P15. Pål Jahre Nilsen, Matteo Chiesa, Peder Hansson and Helge Lie Andersen “[A fluid treatment tank and a well fluid processing system comprising such a tank](#)” **Patent record available from the UK Patent Office (2010)**
- P16. Pål Jahre Nilsen, Matteo Chiesa, Peder Hansson and Helge Lie Andersen “[A fluid treatment tank and a well fluid processing system comprising such a tank](#)” **Patent record available from the World Intellectual Property Organization (WIPO) (2009)**

5.3.2 Journals

¹ Student I have advised

² Post Doc fellow in my lab

³ Student I have co-advised

* Corresponding Author

- J1. T. Souier², C. Maragliano³, M. stefancich, M. Chiesa “How to Achieve High Electrical Conductivity in Aligned Carbon Nanotube Polymer Composites” To Appear *Carbon* (2013)
- J2. C. Maragliano³, S. Lilliu, M.S. Dahlem, M. Chiesa, T. Souier² and M. Stefancich “Effective doping concentration quantification in ZnO thin films by Scanning Kelvin Probe Microscopy” To Appear *JAP* (2013)
- J3. A. Zayan³, M. Mokhtar¹, S. A. Meyers³, P. Armstrong, M. Stefancich and M. Chiesa* “Optical Modeling and Simulation of 100 kW Beam Down Facility at Masdar City, Abu Dhabi, UAE” To Appear in *Journal of Solar Energy Engineering* (2013)
- J4. Sergio Santos², Carlo A. Amadei¹, Albert Verdaguer, Matteo Chiesa* “Size dependent transitions in nanoscale dissipation” *J. Phys. Chem. C*, 2013, 117 (20), pp 10615-10622 DOI: 10.1021/jp4039732
- J5. A. Qadir³, R. Khalilpour, A. Vassalo, M. Chiesa and A Abbas “Potential for Solar-assisted Post-Combustion Carbon Capture in Australia” *Applied Energy* 111, November 2013, Pages 175–185

- J6. C. Maragliano³, L. Colace, S. Rampino, M. Chiesa and M. Stefancich and “Design and optimization of Monochromatic CuIn_xGa(1-x)Se₂ Photovoltaic Cells” *IEEE Transactions on Electron Devices* (2013) **3** 1106 - 1112 [10.1109/JPHOTOV.2013.2258191](http://dx.doi.org/10.1109/JPHOTOV.2013.2258191)
- J7. C.Maragliano³, D.Heskes³, M.Stefancich, M.Chiesa and T.Souier “Decoupling electrostatic and short-range interaction forces combining EFM and AM-AFM techniques” 2013 *Nanotechnology* **24** 225703 <http://dx.doi.org/10.1088/0957-4484/24/22/225703>
- J8. K. R. Gadelrab¹, S. Santos, and M. Chiesa “Heterogeneous dissipative mapping and tip size dependencies of dissipative processes in amplitude modulation atomic force microscopy” *Langmuir*, 2013, **29** (7), pp 2200–2206 DOI: 10.1021/la3044413
- J9. Y. Eissa³, P. R. Marpu, I. Gherboudj, H. Ghedira, T. B. M. J. Ouarda and M. Chiesa “Estimation of direct normal irradiance from Meteosat S 1 EVIRI thermal channels using a neural network ensemble” *Solar Energy* Volume **89**, March 2013, Pages 1–16 <http://dx.doi.org/10.1016/j.solener.2012.12.008>
- J10. K. Gadelrab¹, S. Santos², V. Barcons, J. Font, M. Stefancich, M. Chiesa * “The additive effect of harmonics on conservative and dissipative interactions” *Journal of Applied Physics* Volume: **112** , Issue: 12 Page(s): 124901 - 124901-8 <http://dx.doi.org/+10.1063/1.4769434>
- J11. W. Tesfai³, P. K. Singh, S. J.S. Masharqa³, T. Souier², M. Chiesa and Y. Shatilla “Investigating the effect of suspensions nanostructure on the thermophysical properties of nanofluids” *Journal of Applied Physics* **112** (11), 114315-114315-8 <http://dx.doi.org/+10.1063/1.4768454>
- J12. A. Zayan³, M. Chiesa, M. Stefancich “Point Focus Solar Spectral Splitting System for CPV Applications” *MRS Proceedings / Volume 1493 / 2013* <http://dx.doi.org/10.1557/opl.2013.223>
- J13. L. Z. Broderick, T. Zhang, M. Stefancich, B. R Albert, E. Wang, G. Chen, P. Armstrong, M. Chiesa, L. Kimerling, J. Michel “High Efficiency Solar to Electric Energy Conversion through Spectrum Splitting and Multi-channel Full Spectrum Harvesting” *MRS Proceedings / Volume 1493 / 2013* : <http://dx.doi.org/10.1557/opl.2013.230>
- J14. A. Verdaguer, S. Santos², G. Sauthier, J. J. Segura, M. Chiesa and J Fraxedas “Water induced height artifacts in air dynamic AFM” *Phys. Chem. Chem. Phys.*, 2012,**14**, 16080-16087 DOI: 10.1039/C2CP43031B
- J15. K.R.Gadelrab¹ and M. Chiesa * “Numerically assisted interpretation of nanoindentation data” Accepted *Materials Science & Engineering A* Volume **560**, 10 January 2013, Pages 267–272 <http://dx.doi.org/10.1016/j.msea.2012.09.066>
- J16. T. Souier², S. Santos², M. Stefancich, A. Al Ghaferi and M. Chiesa * “Electrical Conduction in Vertically Aligned Carbon Nanotubes–Polymer Nanocomposites With High Packing Density” *To Nanoscale Research Letters* November 2012, 7:630,

- J17. T. Souier², M. Stefancich and M. Chiesa* "Characterization of multi-walled carbon nanotubes-polymer nanocomposites by conductive probe microscopy" *Nanotechnology* **23** 405704 [doi:10.1088/0957-4484/23/40/405704](https://doi.org/10.1088/0957-4484/23/40/405704)
- J18. K.R. Gadelrab¹, M. Chiesa, M. Hecker, and H.-J. Engelmann "Modeling crack propagation for advanced 4-point bending testing of metal-dielectric thin film stacks" *Eng. Fracture Mechanics* **96**, December 2012, Pages 490–499 <http://dx.doi.org/10.1016/j.engfracmech.2012.08.018>
- J19. M. Chiesa*, K. Gadelrab¹, M. Stefancich, P. Armstrong, G. Li¹, T. Souier², N. H Thomson, V. Barcons, J. Font, A. Verdaguer, M. A. Phillips and S. Santos² "Energy dissipation due to sub-harmonic excitation in dynamic atomic force microscopy" *European Physics Letter* **99** 56002 [doi:10.1209/0295-5075/99/56002](https://doi.org/10.1209/0295-5075/99/56002)
- J20. T. Souier², S. Santos², K. Gadelrab¹, A. Al Ghaferi and M. Chiesa* "Identification and quantification of the dissipative mechanisms involved in CNTs radial permanent deformation" *J. Phys. D: Appl. Phys.* **45** (2012) 335402
- J21. S. Santos², A. Verdaguer and M. Chiesa* "Measuring the apparent height of nanostructures in the presence of adsorbed water layers: water perturbations and attractive to repulsive transitions" *J. Chem. Phys.* **137**, 044201 (2012); <http://dx.doi.org/10.1063/1.4737516>
- J22. M. Chiesa, K. Gadelrab¹, M. Stefancich, P. Armstrong, G. Li¹, T. Souier², N. H Thomson, V. Barcons, J. Font, A. Verdaguer, M. A. Phillips, S. Santos² "Investigation of Nanoscale Interactions by Means of Sub-harmonic Excitation" *The Journal of Chemical Physics Letters* DOI: 10.1021/jz300576p
- J23. S. Santos², K. Gadelrab¹, V. Barcons, M. Stefancich, M. Chiesa* "Quantification of dissipation and deformation in ambient atomic force microscopy" *New J. Phys.* **14** 073044 [doi:10.1088/1367-2630/14/7/073044](https://doi.org/10.1088/1367-2630/14/7/073044)
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5.3.3 *Journal Articles under Review*

- UR1. A. Zayan³, R. Kalapatapu³, S. Wilbert, S. Sgouridis, M. Stefancich, M. Chiesa, P. Armstrong "Impact of Circumsolar Radiation on the Power Output of Eurotroughs in the UAE" Under Review *Solar Energy* (2012)
- UR2. W. Tesfai³, P. K. Singh, S. J.S. Masharqa³, M. Chiesa and Y. Shatilla Effect of Temperature and Volume Fraction on Rheology of Yttria-Ethylene Glycol Nanofluid Under consideration *Nanoscale Research Letters* (2012)
- UR3. L. Rodriguez², M. Chiesa "Thermal characterization of translucent Au thin films by means of frequency domain thermal lensing" Under Review *Optics Express* (2012)
- UR4. Sergio Santos², Karim Gadelrab¹, Josep Font, and Matteo Chiesa* "Single cycle AFM force reconstruction: Probing the time domain" Submitted to *New Journal of Physics* (2013)
- UR5. Carlo A. Amadei¹, Tzu Chieh Tang¹, Matteo Chiesa^a and Sergio Santos² "The aging of a surface and the evolution of conservative and dissipative nanoscale interactions" Under Review *JPCP* (2013)
- UR6. Sergio Santos, Carlo A. Amadei¹, Tzu Chieh Tang¹, Victor Barcons, Matteo Chiesa* "Deconstructing the governing dissipative phenomena in the nanoscale" Under Review *PCCP* (2013)
- UR7. S. Lilliu, C. Maragliano³, M.Hampton, M. Elliot, H. Simmonds, M. Stefancich, M. Chiesa, M. S. Dahlem, and J. E. Macdonald "EFM-spectroscopy data mapped into 2D images of tip-sample contact potential difference and capacitance" Under Review *Ultramicroscopy* (2013)

5.3.4 Conference with Referee Review

- C1. Yehia Eissa, Armel Oumbe, Hosni Ghedira, Matteo Chiesa, Philippe Blanc and Lucien Wald "Circumsolar ratio distribution over desert environments" *SOLAR 2013* Baltimore USA
- C2. S. Lilliu^{1,2}, T. Agostinelli, E. Pires, M. Hampton, M. Al-Hashimi, M. J. Heeney, C. Maragliano, M. Stefancich, M. Chiesa, M. S. Dahlem, J. Nelson, J. E. Macdonald "Nanomorphology of Annealed P3HS and P3HS:PCBM Films for OPV Applications" *ICOE2013*
- C3. Md. M. Rahman, N. Subramanian, T. Souier, M. Chiesa, A. Al Ghaferi "Optimizing Dispersion Conditions of Single-Walled Carbon Nanotubes (SWCNTs) in Water and Organic Solvents Towards Hybrid Solar Cell Application" *2013 MRS Spring meeting*, San Francisco USA
- C4. Samar Alqatari, Feyza B. Oruc, Tewfik Souier, Matteo Chiesa, Ali K. Okyay, and Ammar Nayfeh "Thin Film ALD Deposited ZnO(n)/Si(P+) Hetero-junction Diode" *2013 MRS Spring meeting*, San Francisco USA
- C5. S. Santos, K. Gadelrab, M. Stefancich, P. Armstrong, G. Li, T. Souier, N. H Thomson, V. Barcons, J. Font, A. Verdager, M. A. Phillips and M. Chiesa "Mechanisms and consequences of the presence of sub-harmonic excitation in amplitude modulation atomic force microscopy." *2012 MRS Fall meeting* Boston, USA
- C6. R. Yoosuf, A. Aravind, J. Mk, M. Chiesa, M. Stefancich "Study on magnetic properties of doped ZnO thin films" *2012 MRS Fall meeting* Boston, USA
- C7. M. Chiesa, K. Gadelrab, M. Stefancich, P. Armstrong, G. Li, T. Souier, N. H Thomson, V. Barcons, J. Font, A. Verdager, M. A. Phillips and S. Santos "Sub-harmonic Excitation: a means to probe properties in the nanoscale" *2012 MRS Fall meeting* Boston, USA
- C8. T. Souier K. Gadelrab, M. Stefancich, G. Li, S. Santos and M. Chiesa "Electrical Conduction in Vertically Aligned Carbon Nanotubes Polymer Nanocomposites with High Packing Density" *2012 MRS Fall meeting* Boston, USA
- C9. K.R. Gadelrab, S. Santos, L. Guang, T. Souier and M. Chiesa "From energy dissipation to quantification of fundamental sample properties" *2012 MRS Fall Meeting* Boston, USA
- C10. A. Silvernail, M. Stefancich, M. Chiesa, M. Dahlem "Solar self-tracking light trapping mechanism using thermally activated paraffin for slab waveguide solar concentrator" *2012 MRS Fall Meeting* Boston, USA
- C11. C. Pilscheur, S. Santos, M. Stefancich, M. Chiesa "Characterization of humidity dependent properties of functional coating for solar application." *2012 MRS Fall Meeting* Boston, USA

- C12. K. Gadelrab, G. Li, T. Souier, M.Chiesa “Local Characterization of Austenite and Ferrite Phases in Duplex Stainless Steel Using MFM and Nanoindentation” *2012 MRS Fall Meeting* Boston, USA
- C13. M. Stefancich, A Zayan³, S. Rampino, D. Roncati, L. Kimerling, J. Michel and M. Chiesa “High Efficiency Solar to Electric Energy Conversion through Spectrum Splitting and Multi-channel Full Spectrum Harvesting” *2012 MRS Fall Meeting* Boston, USA
- C14. M. Chiesa , K. Gadelrab, M. Stefancich, P. Armstrong, G. Li, T. Souier, N. H Thomson, V. Barcons, J. Font, A. Verdaguer, M. A. Phillips and S. Santos “Harmonics and sub-harmonic excitation in ambient amplitude modulation atomic force microscopy” *4th Multifrequency AFM Conference* Madrid, October 15-17th, 2012
- C15. A. Verdaguer, S. Santos, G. Sauthier, J. J. Segura, M. Chiesa and J. Fraxedas “Height Artifacts induced by water in air dynamic AFM” *4th Multifrequency AFM Conference* Madrid, October 15-17th, 2012
- C16. S. Santos , K. Gadelrab, M. Stefancich, P. Armstrong, G. Li, T. Souier, N. H Thomson, V. Barcons, J. Font, A. Verdaguer, M. A. Phillips and M. Chiesa “Quantification in ambient amplitude modulation atomic force microscopy” *4th Multifrequency AFM Conference* Madrid, October 15-17th, 2012
- C17. Abdul Qadir, Rajab Khalilpour, Matteo Chiesa, Ali Abbas “Integration of Solar Energy with Post-Combustion Carbon Capture” *QFARF 2012* Doha, Qatar
- C18. S. Santos, G. Li, T. Souier, K. Gadelrab, M. Chiesa and N. H Thomson “How sharp is my AFM tip?” *14th International Scanning Probe Microscopy Meeting* Toronto 2012
- C19. Eissa, Y., Ghedira, H., Ouarda, T. and Chiesa, M. “Challenges of Satellite-Based Solar Resource Assessment in Dusty Environment: The UAE Case Study” *SolarPACES 2012 Conference*, Marrakesh
- C20. A. Oumbe, H. Bru, Z. Hassar, P. Blanc, L. Wald, A. Fournier, D. Goffe, M. Chiesa, H. Ghedira” Selection and implementation of aerosol data for the prediction of solar resource in United Arab Emirates” *SolarPACES 2012 Conference*, Marrakesh
- C21. K. Al-Ali, K. Satoshi, H. Kaneko, H. Sekiguchi, Y. Tamaura and M. Chiesa “Solar Upgrade of Methan using dry reforming in a direct contact bubble reactor ” *SolarPACES 2012 Conference*, Marrakesh.
- C22. R. Kalapatapu S. Wilbert M. Chiesa and P. R. Armstrong “Measurement of Sunshape with a Sunshape Profiling Irradiometer” *SolarPACES 2012 Conference*, Granada.
- C23. G. Sauthier, J. J. Segura, S. Santos, M. Chiesa, J. Fraxedas, A. Verdaguer “Amplitude-modulation AFM-derived heights under suspicion” *ECOSS 2012*

- C24. S. Santos, M. Chiesa and N. Thomson "Getting to the point in atomic force microscopy". Seeing at the Nanoscale, Bristol 2012
- C25. Eissa, Y., Chiesa, M. and Ghedira, H. "Analyzing the Temporal and Spatial Variation of Direct Normal Irradiance Simulated from Artificial Neural Networks". World Renewable Energy Forum: EmPowering the World with Renewable Energy, Colorado, May 13-17, 2012.
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- C29. Y. Eissa, H. Ghedira and M. Chiesa "Tool to Derive Horizontal Irradiance over the UAE" To be Presented at *Annual International Conference on Sustainable Energy and Environmental Science SEES* February 2012
- C30. S. Masharqa, W. Tesfai, P. Singh, M. Chiesa and Y. Shatilla "Thermal Conductivity Behavior of Yttria Nanofluids" To be Presented at ASME 2012 3rd Micro/Nanoscale Heat & Mass Transfer International Conference
- C31. W. Tesfai , P. K. Singh, S. J.S. Masharqa, M. Chiesa and Y. Shatilla "Rheological studies of Yttria nanofluids" Presented at *ASME 2011 International Mechanical Engineers Congress and Exposition, IMECE2011-64720, 11-17 Nov 2011, Denver, Colorado, USA.*
- C32. T. Souier, G. Li, K. GadElrab, S. Santos and M. Chiesa "Nanoscale Imaging of the Electronic Conductivity of the Native Oxide Film on Metals Using Conductive Atomic Force Microscopy" Presented at *2011 MRS Fall meeting* Boston, USA
- C33. S. Santos, K. R. Gadelrab, G. Li, T. Souier and M. Chiesa "How Localised Are Energy Dissipation Processes in Nanoscale Interactions?" Presented at *2011 MRS Fall meeting* Boston, USA
- C34. S. Santos, G. Li, T. Souier, K. R. Gadelrab and M. Chiesa "An Investigation Regarding the True Phenomena behind Water Interactions in Dynamic Nanoscale Processes" Presented at *2011 MRS Fall meeting* Boston, USA
- C35. K. GadElrab, G. Li, T. Souier, S. Santos and M. Chiesa "Numerically Assisted Nanoindentation for Evaluating the Elastic and Plastic Properties of Materials" Presented at *2011 MRS Fall meeting* Boston, USA

- C36. T. Souier, G. Li, K. GadElrab, S. Santos and M. Chiesa "Elaboration and Electrical Properties of Polymer-Multiwall Carbon Nanotubes Nano-Composite" Presented at *2011 MRS Fall meeting* Boston, USA
- C37. G. Li, T. Souier, K. GadElrab, S. Santos and M. Chiesa "Mechanical Properties of High ZT Thermoelectric Bi₂Te₃ Nanocomposite by Nanoindentation." Presented at *2011 MRS Fall meeting* Boston, USA
- C38. Meyers S., M. Mokhtar, M. Chiesa, and P.R. Armstrong. "Improved correlation between luminous intensity and solar flux for a beam down tower configuration" *SolarPACES 2011 Conference*, Granada.
- C39. Kalapatapu, R., M. Chiesa and P.R. Armstrong. "Rotating Shadowband for the Measurement of Sunshape. *Solar Paces 2011 Conference*, Granada.
- C40. D. Milani, A. Abbas, M. Mokhtar and M. Chiesa. "A Computational Model to Evaluate Solar Offset and Water Generation From Atmospheric Moisture Using Location-Specific Annual Climate Data" AICHE Annual Meeting 2011 Minneapolis, MN
- C41. T. Souier A. Alkhatib and M. Chiesa "Morphology-dependent Electrical Transport in Ultra-thin Gold Films: A Study Using Conductive-AFM" Accepted for presentation at the *International Conference on Materials for Advanced Technologies ICMAT* Singapore 2011
- C42. K.R.Gadelrab, and M. Chiesa "Investigation of the mechanical properties of thin films: A new analytical model" *PHYSICS, CHEMISTRY AND APPLICATION OF NANOSTRUCTURES, Minsk 2011*
- C43. T. Souier A. Alkhatib and M. Chiesa "Simulation of Electrical Resistivity of Discontinuous Ultra-thin Metal Films" *International Conference on Materials for Advanced Technologies ICMAT* Singapore 2011
- C44. T. Souier, K.R.Gadelrab, E. Ostby and M. Chiesa "Microstructure and Phase content of HAZ in high strength steel weld by means of MFM and SEM/EDS" *9th International Congress on THERMAL STRESSES* Budapest 2011
- C45. Daniel Kraemer, Bed Poudel, Hsien-Ping Feng, J. Christopher Caylor, Bo Yu, Xiao Yan, Yi Ma, Xiaowei Wang, Dezhi Wang, Andrew Muto, Kenneth McEnaney, Matteo Chiesa, Zhifeng Ren, and Gang Chen "Solar thermoelectric energy conversion" *2011 MRS Spring Meeting*
- C46. K.R.Gadelrab¹, and M. Chiesa* "Influence of Nanoindenter Tip Radius on the Estimation of the Elastic Modulus" *Presented at 2010 MRS Fall Meeting*

- C47. M. Chiesa and W. Hamid “A holistic solution for compact oil treatment separation systems” Presented at ADIPEC 2010
- C48. Mokhtar M., Rubalcaba I., Meyers S., Qadir A., Armstrong P. and Chiesa M.: “Heliostat field efficiency test of beam-down CSP pilot plant: experimental results” Presentation at *SolarPACES 2010*
- C49. Meyers S., Qadir A., Rubalcaba I., Mokhtar M., Chiesa M. and Armstrong P.: “Development of a correlation between luminous intensity and solar flux for the beam-down tower configuration Presented at the *SolarPACES 2010*
- C50. R. Cheaito, A. Schmidt and M. Chiesa: “Application of frequency domain thermorefectance” Presented at the *International Conference of Functional Materials and Nanotechnologies ‘FMNT – 2010’*
- C51. Matteo Chiesa, Yutaka Tamaura and Peter Armstrong “Concentrated Solar Power Deployment in the UAE: Research Needs” Presented at the *International Conference on Renewable Energy Al Ain, UAE*
- C52. Marwan Mokhtar, Muhammad Tauha Ali, Peter R Armstrong and Matteo Chiesa, “Solar Cooling in Abu Dhabi- Prospects and Challenges” Presented at the *International Conference on Renewable Energy Al Ain, UAE*
- C53. Muhammad Tauha Ali, Marwan Mokhtar, Matteo Chiesa, Peter R Armstrong: “Analysis of Weather Sensitivity to Electrical Demand in Abu Dhabi Island ”Presented at the *International Conference on Renewable Energy Al Ain, UAE*
- C54. Ramez A. Cheaito Aaron Schmidt and Matteo Chiesa: “Effect of Higher Harmonics on Frequency-Domain Measurements for the Characterization of Thermal Properties of Thin Films” Presented at the *International Conference on Renewable Energy Al Ain, UAE*
- C55. A. Muto, D. Kraemer, M. Chiesa and G. Chen: “Computationally Efficient Engineering Model for Thermoelectric Design” *International Thermoelectric Society 2008*
- C56. D. Kraemer, L. Lu, A. Muto, G. Chen and M. Chiesa: “Optimization method for a photovoltaic-thermoelectric hybrid system” *Energy Nanotechnology International Conference ASME08*
- C57. Chiesa M. and Simonsen A.J.: “The Importance of Suspension Stability for the Hot-wire Measurements of Thermal Conductivity of Colloidal Suspensions”. *16th Australasian Fluid Mechanics Conference* Australia 2007
- C58. Melheim, J.A., Chiesa, M., Gjelsvik, A.: “Formulation and numerical performance of an adaptive algorithm for efficient collision detection” *Proceedings of the American Society of Mechanical Engineers Fluids Engineering* Art. No. FEDSM2005-77042, pp. 377-383

- C59. Chiesa M. and Melheim J.: "An efficient algorithm for the detection of neighbouring particles: prediction of the behaviour of a bubbling fluidised bed." *Third M.I.T. Conference on Computational Fluid and Solid Mechanics USA 2005*
- C60. M. Chiesa, R. Olsen and J.A Melheim.: "Euler / Langrange simulation of a two-dimensional fluidized bed " *CFD2005 Trondheim Norway 2005*
- C61. Chiesa M. and Lundgaard L.: "Electrocoalescence modelling: an engineering approach". *15th Australasian Fluid Mechanics Conference* Australia 2004
- C62. Chiesa M. and Melheim J.: "Behaviour of water droplets falling in oil under the influence of an electric field". *15th Australasian Fluid Mechanics Conference* Australia 2004
- C63. Chiesa M., Berg G., Melheim J., Ingebrigtsen S.: "Modelling the forces acting on water droplets falling in oil under the influence of an electric field". *5th Electro hydrodynamic International workshop* France 2004
- C64. Melheim J., Chiesa M., Ingebrigtsen S. and Berg G.: "Forces between two water droplets in oil under the influence of an electric field". *International Conference of Multiphase Flow* Japan 2004
- C65. Thaulow, C., Østby, E., Nyhus, B., Skallerud, B. and Chiesa, M. "Fracture Control of Pipelines by Direct Calculations Based on Linespring Technology" Pipe Dreamer's Conference, 7-8 November 2002, Yokohama, Japan, Proceedings: ISBN 0 901360 31 7
- C66. Skallerud B. Chiesa M. and Holmås T.: "Integrated local/global analysis and fracture assessment of pipelines with defects". *Presented at the International Conference on Offshore Mechanics and Arctic Engineering - OMAE 2002*
- C67. Chiesa M., Skallerud B. and Nyhus B., "Efficient numerical procedures for fracture assessment of surface cracked shells". *2nd European Conference on Computational Mechanics, 2001.*
- C68. Chiesa M., Nyhus B., "A constraint-corrected SENT specimen approach for integrity assessment of pipelines". *10th International Congress of Fracture, 2001.*
- C69. Chiesa M., Østby E., Skallerud B. Thaulow.C. and Nyhus B. "Simulation of Behaviour of cracks in welded pipes using line spring elements and advanced fracture models". *10th Congreso Internacional de Ductos Mérida, Yucatá, 14-16 Noviembre del 2000.*

5.3.5 List of Invited Lectures and Talks

- L1. M. Chiesa "Renewable Energy Implementation in the Middle East: Challenges and Opportunities" Solar Cell Conference, Kristiansand June 2013
- L2. M. Chiesa "Detecting water at the nanoscale with high spatial resolutions" Solar Cell Conference, Trondheim June 2013

- L3. M. Chiesa *"Photo activated hydrophobic and hydrophilic behavior of TiO₂"* Politecnico di Milano, Milan June 2013
- L4. M. Chiesa *"The Role of Wettability in Oil Recovery and the Importance of Understanding Complex Interface"* AFM for Energy and Environmental Applications Workshop, Masdar Insitute May 2013
- L5. M. Chiesa *"Measuring nanoscale dissipative interactions with atomic force microscopy"* Boston University, Boston April 2013
- L6. M. Chiesa *"Solar-Assisted Post-combustion Carbon Capture: An ongoing collaboration"* University of Sydney, Sydney September 2012
- L7. M. Chiesa *"The need for advanced material in designing new generation concentrating solar thermal technologies"* CSIRO Newcastle July 2012
- L8. M. Chiesa *"On the role of material science in designing concentrating solar thermal technologies"* OCE Cutting Edge Science Symposia (Key Note Lecture) Sydney July 2012
- L9. M. Chiesa *"Solar Energy Deployment in the UAE: The role of the Masdar Institute"* The Australian Institute of Energy July 2012
- L10. M. Chiesa *"Material needs in the deployment of Solar Energy in the UAE: The role of the Masdar Institute"* CSIRO Linfield July 2012
- L11. M. Chiesa *"Educating the 21st Century engineers: the role of the Shell eco Marathon in the UAE "* Shell Eco-Marathon Rotterdam May 2012
- L12. M. Chiesa and Sergio Santos *"Water induced height artifacts in air dynamic AFM"* Innovation Norway regional meeting in *Mumbai* India April 2012
- L13. M.Chiesa *"Overcoming challenges associated with flow assurance and integration with production technology"* [Flow Assurance and Integrated Production Technology](#) Abu Dhabi January 2012
- L14. M. Chiesa, Sergio Santos and Albert Verdaguer *"The hydrophilicity of a single DNA molecule"* Innovation Norway regional meeting in *Melaka* Malasya December 2011
- L15. M. Chiesa and Peter Armstrong *"The inconvenient truth about Solar Energy in the Middle East"* Tufts University, Boston, USA December 2011
- L16. M. Chiesa *"The prospect for Concentrating Solar Power in the Middle East"* UiB Univeristet I Bergen, Norway November 2011
- L17. M. Chiesa *"Atomic Force Microscopy for the study of functionalized coating for PV applications"* SIMENS Berlin Germany September 2011

- L18. M. Chiesa “Solar Resources assessment in the UAE remote sensing vs. ground station measurements” *Total Nice France* September 2011
- L19. M. Chiesa “ Feasibility study of a Solar Assisted Post Combustion Carbon Capture plant” *Sintef Marintek* Trondheim Norway September 2011
- L20. M. Chiesa, T. Souier and S. Santos “Local Characterization of Nanostructured Thermoelectric Materials for High-performance Flat-panel Solar Thermoelectric Generators” *International Workshop on Scanning Probe Microscopy for Energy Applications* Mainz June 2011
- L21. M. Chiesa “Renewable Energy Prospective in the GCC countries” Innovation Norway regional meeting Oslo Norway June 2011
- L22. M. Chiesa “Prospective on Renewable Energy in Europe” *UiS Universitet i Stavanger* Norway May 2011
- L23. M. Chiesa “Experience with a 100kW beam-down solar concentrator system optical modeling, experimental characterization and local challenges” *World Future Energy Summit* January 2011
- L24. M. Chiesa “Weather Conditions, Dust Accumulation and their effect on PV Performance: Outdoor Testing - Abu Dhabi” *European Future Energy Summit* October 2010
- L25. M. Chiesa “Renewable Energy Technology” *KTH Kungliga Tekniska Högskolan* Stockholm June 2010
- L26. A. Schimdt and M. Chiesa “Characterization Of Nanoscale Liquid Films With Thermo-Reflectance Technique” *First International Nanotechnology Congress Rubén Orellana* Quito 2010.
- L27. M. Chiesa “ Solar Cooling in Abu Dhabi- Prospects and Challenges” *HiB Høgskolen i Bergen* Norway May 2010
- L28. M. Chiesa “Enhanced Separation Technology” Held on the 12th of March 2008 at the workshop on *Management of Emission to Air and Water* St. John’s, NF Canada
- L29. M. Chiesa “Towards compact separation of water from crude oil” Held on the 22nd of March 2007 at INTSOK-Pemex, Ciudad del Carmen
- L30. M. Chiesa “The role of electric field in destabilizing water in crude oil emulsions” 6th of November 2006 at the NPF (Norwegian Petroleum Organization) conference on process technology Holmenkollen Park Hotel Rica, Oslo

5.3.6 List of Technical Manuals

- T1. LVF: “Double block and bleed modular valve assembly – floating type. Installation, operation and maintenance instruction.” Doc DT05e-A Dec. 2003.

5.3.7 *List of Technical Reports and Memos*

- R1. Matteo Chiesa “Internal Report: Masdar Institute Australia Research Collaboration Potential: ME/MSE Focus” (client: **Masdar Institute**) 31/08/2009
- R2. Chiesa M., Kvamsdal H.: “Energy assessment of subsea production systems” SINTEF ARCHIVE, restricted document No 04-020-3953-0
- R3. Hannisdal A., Ludena M., Albarzngy S., Chiesa M.: “Heavy oil separation: Qualification of the VIEC technology for the Jack field development” (client: **Chevron**) Project No 004610-09
- R4. Chiesa M., Hannisdal A., Ludena M., Albarzngy S.: “Heavy oil separation: Qualification of the VIEC technology for the Frade development” (client: **Aibel/Chevron**) Project No 004610-10
- R5. Hannisdal A., Ludena M., Albarzngy S., Chiesa M.: “Heavy oil separation: Qualification of the VIEC technology for the Bressay field” (client: **Aibel/Chevron**) Project No 004610-11
- R6. Hannisdal A., M. Ludena, S. Albarzngy, Chiesa M.: “Heavy oil separation: Qualification of the VIEC technology by Aibel for the Captain field” (client: **Aibel/Chevron**) Project No 004610-12
- R7. Luceda M., Strand R., Chiesa M. “Protocol for detailed operation” (client: **Aibel/Pemex**) Project No 004730-ATP-P-RA-0001
- R8. Bjorklund E., Hannisdal A., Chiesa M. “Alkal B Test trial report, Technical Studies for the Treatment and Conditioning Analysis Determination of Maya Crude for Offshore Regions of PEP” (client: **Aibel/Pemex**) Project No 004730-ATP-P-RA-0004
- R9. Chiesa M. “Challenges and Possibilities for electrostatic technology within the oil sand industry” (client: **Aibel AS**) Project 0047311
- R10. Simonsen A., Chiesa M.: “Multiple bubble model” SINTEF ARCHIVE ISBN No 82-594-2826-1, April 2005, restricted document
- R11. Simonsen A., Chiesa M.: “Modelling of non-spherical bubble” SINTEF ARCHIVE ISBN No 82-594-2793-1, Dec 2004, restricted document
- R12. Chiesa M: “Environmental use of coal on Svalbard” SINTEF memo project No 16X484, 2004
- R13. Chiesa M: “Review of gasification technology for coal application” memo project No 16X484, 2004
- R14. Simonsen A., Chiesa M.: “Modelling of an air-bubble expanding into water” SINTEF ARCHIVE ISBN No 82-594-2695-1, July 2004, restricted document

- R15. Simonsen A., Chiesa M.:“ Investigation of initial air release” SINTEF ARCHIVE ISBN No 82-594-2649-8, April 2004, restricted document
- R16. Are J. Simonsen and Matteo Chiesa. “Verification and improvement of the model for the prediction of the shuttle kinematic. Application to prototype design.” Technical TR F5907, SINTEF Energy Research, December 2003 restricted document.
- R17. Simonsen A., Chiesa M.:“ Verification of the new 1D model for the Bolt gun outflow ” SINTEF ARCHIVE ISBN No 82-594-2546-7, October 2003, restricted document
- R18. Chiesa M., Melheim J.A:“Turbulence calculation in the experimental set-up at the “observation point” ” SINTEF memo, project No 14X20220, 2003
- R19. Norheim S, Chiesa M.:“Coalescence prediction: A macroscopic coalescence model” SINTEF memo, project No 14X20220, 2004
- R20. Melheim J.A, Chiesa M.:“Droplet – droplet forces on meso-scale” SINTEF memo, project No 14X20220, 2003
- R21. Chiesa M., Melheim J.A.:“Electrical forces due to polarization” SINTEF memo, project No 14X20220, 2003
- R22. Chiesa M., Melheim J.A.:“Experimental set up design II” SINTEF memo, project No 14X20220, 2002
- R23. Chiesa M.:“Experimental set up design” SINTEF memo, project No 14X20220, 2002
- R24. Chiesa M., Melheim J. A.:“ Proper electrical force expression for the implementation in the spider code” SINTEF memo, project No 14X20220, 2002

6. TEACHING EXPERIENCE

For more information and details please refer to the teaching portfolio.

6.1 Courses Taught at MI

- [1] **MSE 507 “Thermodynamics of Materials”** Graduate course offered in Fall 2010, 2011, 2012
- [2] **MSE640 “Advances in Investigation of Intermolecular & Surface Forces”** Graduate course (PhD level) offered in Fall 2012.
- [3] **MSE 508 “Kinetics of Materials”** Graduate course offered in Fall 2010 and 2011
- [4] **MSE 502 “Thermodynamics & kinetics of Materials”** Graduate course offered in Fall 2009
- [5] **ME 513 “Concentrating Solar Technology and Applications”** Graduate course offered in Fall 2010 and co-taught.

- [6] **Concentrating Solar Technology and Applications”** Short course offered in Spring 2010 and co-taught

6.2 Courses Taught at NTNU after my doctoral degree

- [7] **KT8305 Continuum Mechanics** Graduate course offered in 2003, 2004 co-taught
- [8] **TFY4345 Classical Mechanics** Undergraduate course offered in spring 2002, 2003, 2004 co-taught

7. PROFESSIONAL SERVICES / AFFILIATION

7.1 Affiliations

MRS (Material Research Society)

NPF (Norsk Petroleumsforening)

7.2 Conference Session Chair

- *SolarPaces 2012* (Chaired session: *WED-2-D: Resource Assessment*)
http://www.solarpaces2012.org/cms/fileadmin/user_upload/SolarPaces2012_Program_6-9-12_WEB.pdf
- Solar Photovoltaic and Thermal Energy session III at the *International Conference on Renewable Energy ICREG'10 Al Ain UAE*

7.3 Scientific Committee

- **Solar Paces:** Served on the 2012 and 2013 scientific committee of the SolarPACES symposium which is the central event at which the international community gathers to share experiences and reflect on the current state of affairs of CSP and Chemical Energy technologies.
<http://www.solarpaces2012.org/cms/committee.html>
- **Academic Evaluation:** Served as a referee for the promotion committee evaluation to the rank of associate professor of a Senior Lecturer at the Faculty of Engineering & Information Technologies University of Sydney. My assessment included the candidate performance in the areas of research, teaching and service to the University/discipline/community. More details can be provided if requested.

7.4 Scientific Conference and Workshop

- With the objective of reaching out to the local community and working towards the development of a rich scientific community in the UAE I am organizing, in collaboration with [Asylum Research](#) and the [Royal Society of Chemistry](#), a scientific workshop on Atomic Force Microscopy (AFM). The workshop will be held at the Masdar Institute in Abu Dhabi on the 20th and 21st of May 2013. The two-day, free workshop includes lectures, equipment

demonstrations, and a poster session. The workshop is meant to attract researchers from the GCC region that are new to AFM as well as experienced AFM scientists that wish to share their research and enhance their AFM knowledge. AFM can be used to investigate materials and material properties used in many of the industries directly associated with the Middle East such as aviation, energy research, petroleum and desalination. Thus the workshop is ideal for researchers in the GCC region that are new to AFM as well as experienced AFM scientists that wish to share their research and enhance their AFM knowledge. See <http://www.lens-online.org/news-a-events/events>

- Assist [RSC \(Royal Society of Chemistry\)](#) to organize a four one-day symposia in different locations in the Gulf region. The topic of the workshop *RSC Materials and Chemistry for New Energy Technologies* is within the topic of interest of the Masdar Institute. My role will be to help suggest four local high caliber speakers to speak at the event.

7.5 Journal Articles Reviewers

Within the last couple of years I have been involved in reviewing more than 20 papers in various journals:

- [Nature](#) (Nature publications)
- [Journal of physical Chemistry](#) (ACS)
- [Nanotechnology](#) (IOP)
- [Journal of Applied Physics](#) (AIP)
- [Progress in Photovoltaic: Research and Applications](#) (Wiley)
- [Journal of Engineering Materials and Technology](#) (ASME)
- [International Journal of Greenhouse Gas Control Articles](#) (Elsevier)
- [Journal of Renewable and Sustainable Energy](#) (AIP)
- [Applied Energy](#) (Elsevier)

7.6 Research Proposal Review and Evaluation

[MIT Energy Initiative](#) '09 reviewed 8 proposals

[MIT Energy Initiative](#) '10 reviewed 2 proposals

[Norwegian Research Council](#) since '09 I was asked to review 4 proposals

8. INSTITUTIONAL SERVICES

8.1 Lab Development

- In 2008 together with Dr. Peter Armstrong the [LENS \(Laboratory for Energy and Nano Science\)](#) was established. The [LENS](#) has, since its start, developed a huge set of experiments that make provides a unique platform for performing cutting edge research within the energy and the nanoscale domain.
 - [Radiometer Platform](#) (follow the link for more information)
 - [Large Area Solar Simulator](#) (follow the link for more information)
 - [Time and Frequency Domain Thermo Reflectance set up](#) (follow the link for more information)
 - [Atomic Force Microscopy](#) (follow the link for more information)
 - [100 KW_{th} beam down solar concentrator](#) (follow the link for more information)

I currently put a lot of efforts in managing, maintaining and further developing this facility on behalf of the whole Masdar Institute.

8.2 Academic affairs activities

Seminar Series Coordinator: During the Academic Year 2012 – 2013 I served as Seminar Coordinator for the Institute. The seminar series is an important platform to strength the academic ecosystem at the institute with the objective of broadening our knowledge, sharing and exchanging ideas and engaging in intellectual discussions.

In addition to the above, a subset of the activities I was involved with is listed below:

- Preparation of calendar for pre-classes 2009
- Follow up of Masdar Institute fellows abroad
- Preparation of Student Handbook 2008
- Recruitment of Masdar Institute Fellowship (MIF) 2008 and 2009
- Participation in the delegation from the Masdar Institute to Australia 2008.
- Accreditation effort within the MSE (still ongoing)
- Student admission committee MSE (still ongoing)
- Faculty recruitment committee (until spring 2012)
- Accreditation effort within the ME program (until fall 2010)
- Student admission committee ME (until fall 2010)

This list could be extended consistently since at the beginning, the Institute did not have a very developed administration and thus the first group of faculty whose I belonged to was asked to participate in many administrative activities.

8.3 Marketing and PR activities

- Interviewed by international media (>10 times)
- Interviewed by local media (>5 times)
- Lead tours of our facility for external visitors (>60 times)

9. INDUSTRIAL SERVICES

- Member in the steering committee of Torresol Energy since 2008
- Process engineering & separation technology consultancy through Aibeltechnology AS and most recently Hamworthy. A list of clients for which I have worked for includes *Shell, Chevron Texaco, Conoco Philips, PEMEX, Exxon Mobile, Statoilhydro, Saudi Aramco*