

# Cristian I Contescu

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## Areas of Research

- Carbon materials for nuclear applications (nuclear graphite)
- Carbon materials for gas storage (hydrogen, methane), separation (carbon dioxide, volatile organic compounds) and electrochemical energy storage
- Surface chemistry of solid materials (nuclear graphite, porous carbon adsorbents, catalysts)
- Physical chemistry at interfaces
- Catalysts preparation and characterization
- Colloid chemistry
- Carbon nanostructures

## Bio

Cristian Contescu graduated from Bucharest University (Magna cum Laude) in 1971, and obtained his doctoral degree from the Bucharest Polytechnic Institute (Romania) in 1979. In his early career years at the Institute of Physical Chemistry in Bucharest (Romania) he directed basic and applied research on oxide catalysts and adsorbents, with a focus on surface reactions on clean metal surfaces and basic principles of catalyst preparation. During 1990-1997 he was a Visiting Scientist and Adjunct Professor in the Department of Chemical Engineering of Syracuse University, working with Prof. James Schwarz on characterization of surface reactivity of heterogeneous catalysts and porous carbons. After holding research scientist positions in industry (Hitco Carbon Composites, in Gardena, CA) and a small business company (Materials Methods LLC, in Newport Beach, CA), he joined Oak Ridge National Laboratory (ORNL) in 2004. Currently, Dr. Contescu holds a Senior Research Staff position in the Materials Science and Technology Division. His current research is focused on surface properties and reactivity of carbon materials – from porous carbons for hydrogen storage, gas purification, and electrochemical energy storage; to nuclear grade high purity graphite used as neutron moderator in high temperature gas-cooled nuclear reactors.

## Professional Services, Awards and Honors

- 2015-2016 Graffin Lecturer of American Carbon Society
- Federal Laboratory Consortium (FLC) Award for Excellence in Technology Transfer (2014)
- R&D 100 Award – team member (2013)
- American Carbon Society, Advisory Committee Member and symposia organizer (since 2013)
- Korean Nuclear Society, Nuclear Engineering and Technology Committee, Member (2012)
- American Society for Standards and Methods (ASTM) – Member, Study Coordinator (2009)
- Editorial Board Member, CARBON journal (since 2008)
- Romanian Academy, Chemical Sciences Division: “G. Spacu” National Award (1991)
- American Chemical Society, symposia co-organizer (2000 – 2004)
- Panelist: DOE-Basic Energy Sciences; DOE-Nuclear Energy
- Board of reviewers of numerous US and international journals

## Selected Projects

- Nuclear graphite chronic oxidation by traces of moisture in helium
- Nuclear graphite acute oxidation by air
- Lignin-derived activated carbon fibers for gas adsorption and separation
- Structure – properties relationship of porous disordered carbons
- Surface chemistry modification of graphite powders for use in lithium ion batteries
- Graphene thermal treatment for use as supercapacitor electrodes
- Atomistic mechanisms of hydrogen storage on nanostructured carbons
- Carbon black selection for fabrication of uranium oxycarbide microspheres

## Facilities Used

- Spallation Neutron Source (SNS)
- High Flux Isotope Reactor (HFIR)
- High Temperature Materials Laboratory (HTML)
- Low Activation Materials Design and Analysis (LAMDA)

## Patents

1. Contescu, C. I., Gallego, N, C, Howe, J. Y. Meyer III, H. M., Payzant, E. A., Wood, D. L., Yoon, A. Y., Denlinger, M. R., “Forming gas treatment of lithium ion battery anode graphite powders”, US Patent 8,834,829 B2, (Sep 16, 2014) <http://www.google.com/patents/US8834829>
2. Taboada-Serrano, P., Tsouris C., Contescu C. I., MacFarlane J, “Magnetic filtration process, magnetic filtering material, and methods for forming magnetic filtering material” US Patent 8,551,617 B2 (Oct. 8, 2013) <http://www.google.com/patents/US8551617>
3. Lara-Curzio E., An, K., Kiggans J. O., Dudney N. J., Contescu C. I., Baker F. S., Armstrong B. L., “Lightweight, durable lead-acid batteries”, US Patent 8,445,138 B2 (May 2013) <http://www.google.com/patents/US8445138>
4. Lara-Curzio E., An, K., Kiggans J. O., Dudney N. J., Contescu C. I., Baker F. S., Armstrong B. L., “Lightweight, durable lead-acid batteries”, US Patent 8,017,273 B2, (Sep 13, 2011) <http://www.google.com/patents/US8017273>
5. Contescu, C. I. and Jaffe, S. M. “Adsorbent Material for Parallel Passage Contactors”, U.S. Patent 7,077,891 B2 (July 18, 2006). <http://www.google.com/patents/US7077891>
6. Putyera, K., Contescu, C. I., Kwabena A., Amato, W., "Post Carbonization Treatment of Microporous Carbons for Enhancement of Methane and Natural Gas Storage Properties", U.S. Patent 6,225,257 B1 (May 1, 2001) <http://www.google.com/patents/US6225257>
7. Patron, L.I., Plostinary S. D., Contescu A., Vass, M., Osiceanu C. P., Cristea M. L., Contescu C. I., Crisan D.D., Stanica C. N., “Combined Oxides on Lanthanides Basis Preparation Process”, Romanian Patent RO 0100723B1 (10.29.1991)

8. Vass, I. Mihail; Diaconescu, V. Antonina Virginia; Contescu, Ion N.M. Cristian: "Process and Device for Nitriding Small Iron and Steel Parts" ("Procedee et Dispositif pour la Nitruration des Petites Pieces en Acier et Fer"), Romanian Patent, RO 0070382 B1 (1985-02-25)

## Specialized Equipment

- Dual furnace thermogravimetric analyzer (SETARAM) coupled with mass spectrometer (Pfeiffer)
- High capacity thermogravimetric balance (home built) for studies of graphite oxidation kinetic
- Automatic volumetric system (Quantachrome) for gas adsorption analysis (BET, pore size distribution) coupled with mass spectrometer (Pfeiffer) for temperature-programmed desorption (TPD-MS), reduction (TPR-MS), and oxidation (TPO-MS)

## Books Edited

1. J. A. Schwarz, C. Contescu and K. Putyera: "Dekker Encyclopedia of Nanoscience and Nanotechnology", Marcel Dekker Inc., New York, in print (1<sup>st</sup> edition, 2004; 2<sup>nd</sup> edition, 2008) and online (<http://www.dekker.com/servlet/product/productid/E-ENN>)
2. J. A. Schwarz and C. Contescu: "Surfaces of Nanoparticles and Porous Materials", in *Surfactant Sciences Series, Vol. 78* (Preface, 29 Chapters, and Subject Index, 816 pages, illustrated), Marcel Dekker Inc., New York (1999).

## Chapters to Books

1. C. I. Contescu and Adriana Contescu, "Oxides and Related Surfaces as Catalyst Supports", invited chapter in "*Encyclopedia of Surface and Colloid Science*", Arthur Hubbard Editor, on-line and print, Marcel Dekker Inc., New York (2002).
2. C. I. Contescu and J. A. Schwarz: "Acid-Base Interactions on Surfaces of Wet and Dry Inorganic Oxides", in "Acid-Base Interactions: Relevance to Adhesion Science and Technology", vol. 2, Ed. K. L. Mittal, VSP BV 2000, Utrecht, 2000, pp. 245 - 274.
3. C. Contescu and J. A. Schwarz: "Acid-Base Behavior of Surfaces of Porous Materials", in "*Surfaces of Nanoparticles and Porous Materials*", *Surfactant Sciences Series, Vol. 78*, Eds. J. A. Schwarz and C. Contescu, Marcel Dekker Inc., New York, 1999, pp. 51 – 102.
4. J. A. Schwarz, Cr. Contescu, J. Jagiello: "Binding Properties of Hydroxyl Groups on Substrates in Aqueous Environments: Their Relationship to Catalyst Preparation", in *Catalysis*, vol. 11, Specialist Periodical Report, Royal Society of Chemistry, Thomas Graham House, Cambridge (UK), 1994, pp.127-165.
5. Melanie Moses-Debusk, Chaitanya Narula, Cristian Contescu: "Surface Chemistry and Properties of Oxides as Catalyst Supports", *Encyclopedia of Surface and Colloid Science*, CRC Press, 3<sup>rd</sup> Edition, Ten Volume Set, (printed 2015)
6. T. D. Burchell, C. I. Contescu, N. C. Gallego, "Activated carbon fibers for gas storage". In "Activated Carbon Fiber and Textiles", Ed. Jonathan Y. Chen, Elsevier (2017) p. 305-335 [<http://dx.doi.org/10.1016/B978-0-08-100660-3.00012-2>].

## Peer-reviewed Publications

1. L R Olasov, F W Zeng, J B Spicer, N C Gallego, C I Contescu, "Modeling the effects of oxidation-induced porosity on the elastic moduli of nuclear graphites", *Carbon* 141 (2019) 304-315

2. B J Riley, J McFarlane, G D DelCul, J D Vienna, C I Contescu, C W Forsberg, “Molten salt reactor waste and effluent management strategies: A review”, *Nucl. Eng. Design* 345 (2019) 94-109
3. J D Arregui-Mena, C I Contescu, A A Campbell, P D Edmondson, N C Gallego, A B Smith, K Takizawa, Y Katoh, “Nitrogen adsorption data, FIB-SEM tomography and TEM micrographs of neutron-irradiated superfine grain graphite”, *Data in Brief* 21 (2018) 2643-2650
4. S Adhikari, Z Hood, N Gallego, C Contescu, “Lignin-derived carbon fibers as efficient heterogeneous solid acid catalysts for esterification of oleic acid”, *MRS Advances*, 2018 Materials Research Society, doi: 10.1557/adv.2018.481
5. J J Kane, A C Mathews, C J Orme, C I Contescu, W David Swank, W E Windes, “Effective gaseous diffusion coefficients of select ultra-fine, super-fine and medium grain nuclear graphite”, *Carbon* 136 (2018) 369-379
6. C I Contescu, S F Adhikari, N C Gallego, B D Evans, B E Bliss, “Activated carbons derived from high-temperature pyrolysis of lignocellulosic biomass”, *C 4* (2018) 51; doi:10.3390/c4030051
7. C I Contescu, R W Mee, Y Lee, J D Arregui-Mena, N C Gallego, T D Burchell, J J Kane, W E Windes, “Beyond the classical kinetic model for chronic graphite oxidation by moisture in high temperature gas-cooled reactors”, *Carbon* 127 (2018) 158-169; Corrigendum: *Carbon* 140 (2018) 249
8. R J Olsen, A K Gillespie, C I Contescu, J W Taylor, P Pfeiffer, J R Morris, “Phase transition of H<sub>2</sub> in subnanometer pores observed at 75 K”, *ACS Nano*, 11 (2017) 11617-11631
9. J J Kane, C I Contescu, R E Smith, G Strydom, W E Windes, Understanding the reaction of nuclear graphite with molecular oxygen: Kinetics, transport, and structural evolution, *J. Nucl. Mater* 493 (2017) 343-367
10. X Zhou, C I Contescu, X Zhao, Z Lu, J Zhang, Y Ktoh, Y Wang, B Liu, Y Tang, C Tang, Oxidation behavior of matrix graphite and its effect on compressive strength, *Sci Technol Nucl Installations*, 2017, Article ID 4275375, 6 pages
11. C W Forsberg, S Lam, D M Carpenter, D G Whyte, R Scarlat, C Contescu, L Wei, J Stempien, E Blandford, Tritium control and capture in salt-cooled fission and fusion reactors: Status, challenges and path forward, *Nucl. Technol.* 197 (2017) 1-21; <http://dx.doi.org/10.13182/NT16-101>
12. H Wu, R Gakhar, C I Contescu, R Scarlat, “Study of tritium transport in nuclear-grade graphite and molten fluoride salt systems”, *Transactions of the American Nuclear Society*, 116 (2017) 281-284; ANS Annual Meeting, San Francisco, CA, June 11-15, 2017
13. L Spicer, F Zeng, N Gallego, C I Contescu, “Laser ultrasonic assessment of the effects of oxidation and microcracking on the elastic moduli of nuclear graphite”, *Proceedings of 2017 IEEE International Ultrasonics Symposium*, Washington, DC September 6-9, 2017 (in electronic format on CD); ISBN 978-1-5386-3382-3; IEEE Catalog Number: CFP17ULT-USB. Manuscript ID: 00569 (4 pages)
14. J Bahadur, C I Contescu, A J Ramirez-Cuesta, E Mamontov, N C Gallego, Y Cheng, L L Daemen, Y B Melnichenko, Properties of immobile hydrogen confined in microporous carbon, *Carbon* 117 (2017) 383-392
15. F W Zeng, C I Contescu, N C Gallego, J B Spicer, Theory and application of laser ultrasonic shear wave birefringence measurements to the determination of microstructure orientation in transversely isotropic, polycrystalline graphite, *Carbon* 115 (2017) 460-470
16. J Bahadur, C I Contescu, D J Rai, N C Gallego, Y B Melnichenko, Clustering of water molecules in ultramicroporous carbon: In-situ small-angle neutron scattering, *Carbon* 111 (2017) 681-688

17. E Mamontov, Y Yue, J Bahadur, J Guo, C I Contescu, N C Gallego, Y B Melnichenko, Hydration level dependence of the microscopic dynamics of water adsorbed in ultramicroporous carbon, *Carbon* **111** (2017) 705-712
18. L L Snead, C I Contescu, T S Byun, W D Porter, Thermophysical property and pore structure evolution in stressed and non-stressed neutron irradiated IG-110 nuclear graphite, *J. Nucl. Mater.* **476** (2016) 102-109
19. R J Olsen, J W Taylor, C I Contescu, J R Morris, "Nuclear spin correlations and collective excitations in supercritical H<sub>2</sub>", *arXiv:1602.01811v1 [cond-mat.mtr.-sci]* (e-print 01/2016)
20. J B Spicer, L R Olasov, F W Zeng, K Han, N C Gallego, C I Contescu, "Laser ultrasonic assessment of the effects of porosity and microcracking on the elastic moduli of nuclear graphite". *J. Nucl. Mater.* **471** (2016) 80-91
21. J Bahadur, Y B Melnichenko, L He, C I Contescu, N C Gallego, J R Carmichael, "SANS investigation of CO<sub>2</sub> adsorption in microporous carbon". *Carbon* **95** (2015) 535-544
22. Y Meng, T M Young, P Liu, C I Contescu, B Huang, S Wang, "Ultralight carbon aerogel from nanocellulose as a highly selective oil absorption material", *Cellulose* **22** (2015) 435-447.  
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23. J Guo, J Lee, C I Contescu, N C Gallego, S T Pantelides, S J Pennycook, B A Moyer, M F Chisholm, "Crown ethers in graphene", *Nature Communications*, vol 5 (2014) article number 5389; doi: 10.1038/ncomms5389;  
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24. L He, Y B Melnichenko, N C Gallego, C I Contescu, J Guo, "Investigation of morphology and hydrogen adsorption capacity of disordered carbons", *Carbon* **80** (2014) 82-90;  
<http://www.sciencedirect.com/science/article/pii/S0008622314007817>
25. C I Contescu, R W Mee, P Wang, A V Romanova, T D Burchell: "Oxidation of PCEA nuclear graphite by low water concentrations in helium". *J Nuclear Materials* **453** (2014) 225-232  
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26. N C Gallego, C I Contescu, H M Meyer III, J Y Howe, R A Meisner, A E Payzant, M J Lance, S Yoon, M Denlinger, D L Wood III, "Advanced surface and microstructural characterization of natural graphite anodes for lithium ion batteries", *Carbon* **72** (2014) 393-401  
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27. Y Ihm, V R Cooper, N C Gallego, C I Contescu, J R Morris: "Microstructure-dependent gas adsorption: Accurate predictions of methane uptake in nanoporous carbons", *J Chemical Theory Computation* **10** (2014) 1-4  
<http://pubs.acs.org/doi/abs/10.1021/ct400875n>
28. M S El-Genk, J P Tournier, C I Contescu, "Chemical kinetics parameters and model validation for the gasification of PCEA nuclear graphite", *J. Nuclear Materials* **444** (2014) 112-128;  
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31. C I Contescu, H Zhang, R J Olsen, E Mamontov, J R Morris, N C Gallego: "Isotope effect on adsorbed quantum phases: Diffusion of H<sub>2</sub> and D<sub>2</sub> in nanoporous carbon". *Physical Review Letters* 110 (2013) 236102 (5 pages) <http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.110.236102>
32. J Guo, J R Morris, Y Ihm, C I Contescu, N C Gallego, G Duscher, S J Pennycook, M F Chisholm: "Topological Defects: Origin of Nanopores and Enhanced Adsorption Performance in Nanoporous Carbon", *Small* 8 (2012) 3283-3288; <http://onlinelibrary.wiley.com/doi/10.1002/sml.201200894/full>
33. D Saha, C I Contescu, N C Gallego: "Tetrahydrofuran-Induced K and Li Doping onto Poly(furfuryl alcohol)-Derived Activated Carbon (PFAC): Influence on Microstructure and H<sub>2</sub> Sorption Properties", *Langmuir* 28 (2012) 5669-5677 <http://pubs.acs.org/doi/abs/10.1021/la3002948>
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35. H Zhang, V V Bhat, N C Gallego, C I Contescu: "Thermal Treatment Effects on Charge Storage Performance of Graphene-Based Materials for Supercapacitors", *ACS Appl Mater Interfaces* 4 (2012) 3239-3246 <http://pubs.acs.org/doi/abs/10.1021/am300593k>
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37. W Dmowski, C I Contescu, A Llobet, N C Gallego, T Egami: "Local Atomic Density of Microporous Carbons", *J Phys Chem C* 116 (2012) 2946-2951; <http://pubs.acs.org/doi/abs/10.1021/jp209824f>
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## Reports and Technical Memoranda

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3. N C Gallego, C I Contescu, T D Burchell, "XRD and SANS evaluation of HOPG and polycrystalline graphite", ORNL/TM-2018/871 (June 2018)
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6. C I Contescu, R W Mee, "Status of chronic oxidation studies of graphite", ORNL/TM-2016/195 (May 2016); <https://info.ornl.gov/sites/publications/files/Pub62781.pdf>
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## Conference Talks and Proceedings

1. A A Campbell, J D Arregui-Mena, Y Kato, C I Contescu, “Mechanical and thermal behavior of graphite in nuclear reactor applications”, TMS Annual Meeting, San Antonio, TX, March 10-14 (2019)
2. AA Campbell, N C Gallego, C I Contescu, J R Keiser, S S Raiman, T D Burchell, A L Qualls, “Holistic understanding of graphite behavior in MSR environments”, TMS Annual Meeting, San Antonio, TX, March 10-14 (2019)
3. S-H Chi, C I Contescu, J J Lee, G-S Choi, “Nuclear graphite inhomogeneity as revealed by nonuniformity of oxidation rates and new billet qualification requirements”, Trans. Korean Nuclear Society Meeting, Jeju, Korea, May 17-18, 2018, paper P01E11
4. J J Lee, S S Raiman, Y Katoh, C I Contescu, X Hu, “Chemical compatibility of silicon carbide in the fluoride salt-cooled high temperature reactor”, American Nuclear Society, Philadelphia, PA, June 17-21, 2018
5. N Gallego, C Contescu, L he, T Burchell, “Neutron irradiation effects on nuclear graphite microstructure”, Carbon 2918, Madrid (Spain)
6. C Contescu, A Campbell, N Gallego, K Takizawa, Y Katoh, “Mesopore development in irradiated graphite”, International Nuclear Graphite Specialists Meeting (INGSM-2017), Baltimore, MD, September 17-21, 2017 (oral) – proceedings distributed in electronic form.
7. Y Lee, C I Contescu, R W Mee, “Chronic oxidation of Mersen 2114 fine grained nuclear graphite by water vapor in normal HTGR operations”, International Nuclear Graphite Specialists Meeting (INGSM-2017), Baltimore, MD, September 17-21, 2017 (oral) – proceedings distributed in electronic form
8. J B Spicer, N C Gallego, L R Olasov, F W Zeng, C I Contescu, “Effects of microstructure on elastic modulus measurements”, International Nuclear Graphite Specialists Meeting (INGSM-2017), Baltimore, MD, September 17-21, 2017 (oral) – proceedings distributed in electronic form
9. C Contescu, “Chronic Graphite Oxidation: Recent Results”, Advanced Reactor Technologies, Advanced Materials Program Review, DOE NE Office Building, Germantown, MD, June 6-7, 2017
10. L Spicer, F Zeng, N Gallego, C Contescu, “Laser ultrasonic assessment of the effects of oxidation and microcracking on the elastic moduli of nuclear graphite”, 2017 IEEE International Ultrasonics Symposium, Washington, DC September 6-9, 2017 (oral); Abstract ID 00569.
11. N Gallego, B Biss, N Evans, C Contescu, “Activation of chars derived from high temperature cellulosic biomass pyrolysis”, CARBON 2017, Melbourne, Australia, July 23-28, 2017 (poster)
12. C Contescu, J Bahadur, E Mamontov, N Gallego, “Molecular clustering and microscopic dynamics of water in ultramicroporous carbon”, CARBON 2017, Melbourne, Australia, July 23-28, 2017 (oral)

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14. C Contescu, J Bahadur, A Ramirez-Cuesta, E Mamontov, L He, N Gallego, "Properties of molecular hydrogen confined in microporous carbons investigated by neutron spectroscopy techniques", The 6<sup>th</sup> Symposium on Challenges for Carbon-based Nanoporous Materials, Nagano, Japan, July 19-21, 2017 (invited)
15. X Zhou, A A Campbell, Y Katoh, Z Lu, J Zhang, Z I Contescu, B Liu, "Property evaluation and microstructure characterization of the A3-3 matrix graphite", 2016 International Topical Meeting on High Temperature Reactor Technology (HTR2016) Las Vegas, NV, Nov. 6-10, 2016 (pp. 772-775)
16. C Contescu, "The amazing properties of nuclear graphite and its use for clean energy generation", Hopkins Extreme Materials Institute (invited talk), Johns Hopkins University, Baltimore, MD (October 21<sup>st</sup>, 2016)
17. C Contescu, R Mee, J Kane, N Gallego, T Burchell, W Windes, "Kinetic models for oxidation of nuclear graphite by moisture in helium coolant" ROMPHYSICHEM 16 (Romanian Conference of Physical Chemistry, 16<sup>th</sup> edition), Galati, Romania (September 21-23, 2016).
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24. N C Gallego, C I Contescu, D Webb, Y Yue, P Fulvio, C Tran, "Production and characterization of lignin-based activated carbon fibers (ACF)", CARBON 2016, The World Conference on Carbon, Penn State University, State College, PA (July 10-15, 2016) - proceedings in electronic form
25. C Contescu, "Graphite oxidation model development", Advanced Materials Program Review, Advanced Reactor Technologies, Department of Energy – Nuclear Energy Office, Germantown, MD (June 7-8, 2016)
26. C Contescu, "The amazing properties of nuclear graphite and its use for clean energy generation" Invited talk, Hopkins Energy Materials Institute, Johns Hopkins University, Baltimore, MD, October 21<sup>st</sup>, 2016

27. C Contescu, N C Gallego, E Mamontov, Y B Melnichenko, L He, A I Kolesnikov, E J Olsen, J R Morris, "Hydrogen confined and restrained in overcrowded carbon nanopores", CESEP 2015 – Carbon for Energy Storage/Conversion and Environment Protection, Poznan (Poland) October 18-22, 2015
28. C Contescu, N Gallego, J Spicer, L Olov, K Han, F Zeng, "Graphite for clean nuclear energy" CESEP 2015 – Carbon for Energy Storage/Conversion and Environment Protection, Poznan (Poland) October 18-22, 2015
29. C Contescu, J Kane, R Mee, A Bontorno, N Gallego, T Burchell, W Windes, "Reactivity differences between graphite grades during long time exposure in the helium coolant", INGS-16, International Nuclear Graphite Specialists Meeting, Nottingham, UK, September 13-17, 2015
30. N C Gallego, C I Contescu, T D Burchell, M Kirkham, L He, D Changwoo, "Annealing studies of irradiated HOPG using XRD and SANS measurements", INGS-16, International Nuclear Graphite Specialists Meeting, Nottingham, UK, September 13-17, 2015
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35. C I Contescu: "This ubiquitous carbon..." invited talk at the ASM Oak Ridge chapter annual Social Night (Knoxville, TN; January 16, 2014)
36. N C Gallego, C I Contescu: "Production and characterization of lignin-based activated carbon fibers", invited talk at CARBON 2104 International Conference (Jeju Island, Korea; June 29 – July 5, 2014) – distributed in Proceedings on CD
37. N C Gallego, C I Contescu, L He, Y Melnichenko: "Properties of hydrogen confined in nanopores of activated carbon", presentation at CARBON 2104 International Conference (Jeju Island, Korea; June 29 – July 5, 2014) – distributed in Proceedings on CD
38. C I Contescu: "Hydrogen in carbon nanopores: Confined in overcrowded spaces and severely restrained", invited talk at the International Workshop on Structure and Dynamics of Confined and Interfacial Fluids: Blending Scattering, Spectroscopy and Computer Modeling Techniques (Oak Ridge, TN; July 16-18, 2014)
39. L He, Y B Melnichenko, N C Gallego, C I Contescu: "Investigation of morphology and hydrogen adsorption capacity of nanoporous carbons", presentation at ACNS 2014 – American Conference on Neutron Scattering, (Knoxville, TN; June 1-5, 2014)
40. C I Contescu, J R Morris, E Mamontov, R J Olsen, N C Gallego: "Quantum sieving of hydrogen confined in nanoporous carbon", presentation at ACNS 2014 – American Conference on Neutron Scattering (Knoxville, TN; June 1-5, 2014)

41. C I Contescu, R W Mee, T D Burchell: "Kinetics of chronic oxidation of PCEA nuclear graphite by moisture in helium coolant", presentation at the GEN IV 8<sup>th</sup> Official Graphite Working Group, Japan Atomic Energy Agency (Oarai - Ibaraki, Japan; April 14-15, 2014).
42. C I Contescu: "Graphite oxidation: Analysis and modeling results", presentation at the Advanced Materials R&D Program Review, organized by DOE-NE Advanced Reactor Technologies Program (Oak Ridge, TN; May 6-8, 2014)
43. C. I Contescu: Mesoscale – the new frontier in carbon science, plenary lecture at ROMPHYSICHEM 15, the 15<sup>th</sup> Romanian Conference of Physical Chemistry, Bucharest, Romania, September 11-13, 2013
44. C I Contescu: Chronic oxidation of nuclear graphite, talk at 6<sup>th</sup> Annual Technical Review Meeting, VHTR Technology Development Office, Idaho Falls, May 9, 2013
45. C I Contescu: Effect of chemical environmental factors on nuclear graphite physical properties, **[invited talk]** University of Minnesota, Minneapolis, May 10, 2013
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