

CURRICULUM VITAE

Surname: **Chalmpes**

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1. Education – Professional Experience

- 07/2026 – Today Assistant Professor, Department of Chemistry, University of Crete, Greece.
- 06/2025 – Today Research associate at Cornell University, Department of Materials Science & Engineering, College of Engineering, New York, United States of America (USA).
- 01/2022 – 05/2025 Postdoctoral associate at Cornell University, Department of Materials Science & Engineering, College of Engineering, New York, United States of America (USA).
(Research group of Prof. Emmanuel P. Giannelis)
- 01/2018 - 10/2021 PhD candidate at the Department of Materials Science & Engineering, School of Engineering, University of Ioannina.
Dissertation title: “*Development and study of novel two dimensional nanostructures for technological applications*”.
Grade: **Excellent**
Supervisor: Prof. Dimitrios Gournis
- 11/2016 - 04/2018 Interdepartmental Master of Science (MSc) in *Chemistry and Technology of Materials*, Departments of Materials Science & Engineering, Chemistry and Physics, School of Engineering and School of Sciences, University of Ioannina (Grade: **9.53/10**)
Master Thesis: “*Layer-by-Layer (LbL) development of hybrid inorganic two-dimensional materials*”.

10/2011 - 07/2016 Diploma in Materials Science & Engineering (Integrated Master),
University of Ioannina, Greece (Grade: **8.17/10**)
Diploma Thesis: “*Development and study of low dimensional thin films of Germanane (GeH) nanostructures*”.

1.1 Research Interests and Activities

N. Chalmpes is an experimentalist and synthetic materials engineer specializing in nanostructured materials. His research focuses on the synthesis and functionalization of two-dimensional (2D) materials—particularly carbon-based layered structures, transition metal dichalcogenides (TMDs), germanane—as well as various carbon nanostructures such as carbon nanotubes, fullerenes, graphene, carbon dots. He also works extensively with porous carbons, metallic (magnetic or semiconducting) nanoparticles, biocatalysts, and the development of ultra-high surface area nanomaterials.

These materials are evaluated for their (electro)catalytic performance, in environmental applications, energy production and storage and biocatalytic processes. Special emphasis is placed on the design, synthesis, and performance assessment of nanomaterials for key catalytic reactions, including the oxygen reduction reaction (ORR) in both proton- and anion-exchange membrane fuel cells. Additionally, ultra-high surface area nanomaterials are explored as CO₂ sorbents and for energy and gas storage applications.

Synthetic approaches: intercalation reactions, hypergolic reactions, sol-gel, hydrothermal synthesis, solid state reactions, Catalytically Chemical Vapor Deposition (CCVD), Langmuir-Blodgett.

Certified user after completing all training requirements of: Bruker-D8-Powder-Diffractometer, Vacuum-FT-IR, Renishaw-InVia-Confocal-Raman-microscope, UV-Vis-NIR-Spectrometer, ESR, N₂ porosimetry measurements, AFM and Field Emission SEM – EDS, TEM microscopies.

Extensive experience on:

- AFM (*Peak Force Tapping mode on a Bruker Multimode 8, Nanoscope 6 and Bruker Multimode 3D Nanoscope*): i) nanomechanical properties and stability of *liquid-liquid* and *liquid-solid* interfaces, ii) topography profiles iii) particle/2D nanostructures characterization.
- Field Emission SEM (*Zeiss Gemini 500-FESEM and Zeiss-Sigma-500-FESEM*): high resolution imaging at high, low and ultra-low accelerating voltages. Mapping analysis by using multi-segmented detector for bright field and annular dark field Scanning Transmission Electron Microscope of very thin samples and an Oxford Instruments Ultim Max detector for Energy-dispersive X-ray spectroscopy.
- TEM (*FEI Tecnai 12 BioTwin*): typically operated at 120 kV (aligned also at 60, 80, and 100 kV if needed) and imaging samples at both room and cryo temperatures.

- Raman (*Renishaw InVia microRaman system*): spectroscopic characterization of nanostructures. Excitation wavelengths of 488, 532 and 785 nm.
- N₂ porosimetry (*Micromeritics ASAP 2460*): Porosimetry measurements in the P/P_0 range of 10⁻⁶ to 0.99.
- XRD (*Bruker D8 Advance ECO powder*): x-ray diffraction patterns from powdered samples. Data analyzed by Jade software package.

2. Honors – Distinctions – Scholarships

1. Ranked 1st in MSc studies (**9.53/10**) in the department of Materials Science Engineering, School of Engineering, University of Ioannina.
2. 1st prize in the 12th Panhellenic Conference on Chemical Engineering, 29-31 May, 2019 Athens, Greece in the thematic area "Materials - Nanotechnology".

N. Chalmpes, M. Patila, K. Spyrou, Ch. Gioti, A. Kouloumpis, K. C Vasilopoulos, Ch. Alatzoglou, I. V Yentekakis, M. A Karakassides, H. Stamatis, P. Rudolf, D. Gournis, *Graphene/Cytochrome c hybrid thin films prepared by a modified Langmuir-Schaefer method*.

3. Scholarship from the Greek State Scholarships Foundation (IKY) for the entire period of the PhD (36 months) at the Department of Materials Science Engineering, School of Engineering, University of Ioannina, Greece.

The research was co-financed by Greece and the European Union (European Social Fund – ESF) through the Operational Programme “Human Resources Development, Education and Lifelong Learning” in the context of the project “Strengthening Human Resources Research Potential via Doctorate Research” (MIS-5000432)

Scholarship grant agreement: 2018-050-0502-13770

4. The 2024 ACS Nano publication by **N. Chalmpes*** *et al.*, titled "*Ultrahigh Surface Area Nanoporous Carbons Synthesized via Hypergolic and Activation Reactions for Enhanced CO₂ Capacity and Volumetric Energy Density*," has been recognized by NY News, the Cornell Chronicle, the Washington Post and other outlets as a groundbreaking research achievement. It is also featured on Wikipedia, under the “Activated Carbon” section, as reporting the highest surface area ever achieved for carbon nanostructures.

3. Publications / Conferences / Bibliometrics

- Author of **65 international publications** in peer reviewed journals

Published articles in journals such as: *Nature, Advanced Functional Materials, ACS Nano, Angewandte Chemie, Chemistry of Materials, ACS Applied Materials & Interfaces, Chemical Engineering Journal, Small, Journal of Colloid and Interface Science, ACS Applied Nano Materials.*

- Author of **2 papers** (referred) **in book series**
- Inventor of **4 international patents**
- **26** oral / poster presentations

3.1 Refereeing – Editorial – Memberships

- **Editor of Special Issue** “Carbon Nanostructures for Energy Storage Applications” in *Frontiers in Materials*.
- **Editor of Special Issue** “Nanomaterials for Sustainable Waste Conversion, Energy Production, and Environmental Applications” in *Micro* (co-eds. C. Salmas and M. A. Karakassides).
- **Review Editor** in *Frontiers in Materials* for Carbon-based Materials.
- **Referee** in >20 **journals**, e.g. *Nature Communications, ACS Applied Materials & Interfaces, Nanomaterials, Molecules Polymers, Materials, Membranes, Applied Sciences, Microorganisms, Chemical Engineering and Processing, International Journal of Molecular Sciences, Inorganics, Biomass Conversion and Biorefinery etc.*

4A. Publications in refereed journals

B1. A. Kouloumpis, E. Thomou, **N. Chalmpes**, K. Dimos, K. Spyrou, A. B. Bourlinos, I. Koutselas, D. Gournis and P. Rudolf. Graphene/carbon-dot hybrid thin films prepared by a modified Langmuir-Schaefer method. *ACS Omega* (2017) Vol. 2, No. 5, p. 2090–2099.

B2. A. Kouloumpis, N. Vourdas, P. Zygouri, **N. Chalmpes**, G. Potsi, V. Kostas, K. Spyrou, V. N. Stathopoulos, D. Gournis and P. Rudolf. Controlled deposition of fullerene derivatives within a graphene template by means of a modified Langmuir-Schaefer method. *Journal of Colloid and Interface Science* (2018) Vol. 524, p. 388-398.

B3. K. Tsirka, A. Katsiki, **N. Chalmpes**, D. Gournis, and A. Paipetis. Mapping of graphene oxide and single layer graphene flakes – Defects Annealing and Healing. *Frontiers in Materials* (2018) Vol. 5, article 37, p.p. 11.

B4. D. Karageorgou, E. Thomou, N. T. Vourvou, K. M. Lyra, **N. Chalmpes**, A. Enotiadis, K. Spyrou, P. Katopodis, D. Gournis and H. Stamatis. Antibacterial and algicidal effects of porous carbon cuboid nanoparticles. *ACS Omega* (2019) Vol. 4, No. 3, p. 4991-5001.

B5. A. Enotiadis, M Tsokaridou, **N. Chalmpes**, V. Sakavitsi, K. Spyrou and D. Gournis. Synthesis and characterization of porous clay-organic heterostructures. *Journal of Sol-Gel Science and Technology* (2019) Vol. 91, No. 2, p. 295-301.

B6. M. Baikousi, **N. Chalmpes**, K. Spyrou, A. B. Bourlinos, A. Avgeropoulos, D. Gournis and M. A. Karakassides. Direct production of carbon nanosheets by self-ignition of pyrophoric lithium

B7. A. V. Chatzikonstantinou, E. Gkantzou, E. Thomou, **N. Chalmpes**, K.-M. Lyra, V. G. Kontogianni, K. Spyrou, M. Patila, D. Gournis and H. Stamatis. Enzymatic conversion of oleuropein to hydroxytyrosol using immobilized β -glucosidase on porous carbon cuboids. *Nanomaterials* (2019) Vol. 9, No. 8, article 1166.

B8. **N. Chalmpes**, A. Kouloumpis, P. Zygouri, N. Karouta, K. Spyrou, P. Stathi, T. Tsoufis, V. Georgakilas, D. Gournis and P. Rudolf. Layer-by-layer assembly of clay-carbon nanotube hybrid superstructures. *ACS Omega* (2019) Vo. 4, No. 19, p. 18100–18107.
dialkylamides in air. *Materials Letters* (2019) Vol. 254, p. 58-61.

B9. A. Giannakopoulou, M. Patila, K. Spyrou, **N. Chalmpes**, D. Zarafeta, G. Skretas, D. Gournis and H. Stamatis. Development of a four-enzyme magnetic nanobiocatalyst for multi-step cascade reactions. *Catalysts* (2019) Vol. 9, No. 12, article 995 (p.p. 22).

B10. G. Potsi, A. B. Bourlinos, V. Mouselimis, K. Poláková, **N. Chalmpes**, D. Gournis, S. Kalytchuk, O. Tomanec, P. Błoński, M. Medved, M. Otyepka and R. Zbořil. Intrinsic photoluminescence of amine-functionalized graphene derivatives for bioimaging applications. *Applied Materials Today* (2019) Vol. 17, p. 112-122.

B11. **N. Chalmpes**, K. Spyrou, A. B. Bourlinos, D. Moschovas, A. Avgeropoulos, M. A. Karakassides and D. Gournis. Synthesis of highly crystalline graphite from spontaneous ignition of in situ derived acetylene and chlorine at ambient conditions. *Molecules* (2020) Vol. 25, No. 2,

article 297.

B12. G. Zapsas, D. Moschovas, K. Ntetsikas, A. Karydis-Messinis, **N. Chalmes**, A. Kouloumpis, D. Gournis, N. E. Zafeiropoulos and A. Avgeropoulos. Segregation of maghemite nanoparticles within symmetric diblock copolymer and triblock terpolymer patterns under solvent vapor annealing. *Materials* (2020) Vol. 13, No. 6, article 1286 (p.p. 15).

B13. **N. Chalmes**, K. Spyrou, K. C. Vasilopoulos, A. B. Bourlinos, D. Moschovas, A. Avgeropoulos, Ch. Gioti, M. A. Karakassides and D. Gournis. Hypergolics in carbon nanomaterials synthesis: new paradigms and perspectives. *Molecules* (2020) Vol. 25, No. 9, article 2207 (p.p. 11).

B14. A. V. Chatzikonstantinou, A. C. Polydera, E. Thomou, **N. Chalmes**, T. N. Baroud, A. Enotiadis, L. Estevez, M. Patila, M. A. Hammami, K. Spyrou, E. P. Giannelis, A. G. Tzakos D. Gournis and H. Stamatis. Lipase-immobilized on magnetic hierarchically porous carbon materials as a versatile tool for the synthesis of bioactive quercetin derivatives. *Bioresource Technology Reports* (2020) Vol. 9, article 100372 (p.p. 10).

B15. **N. Chalmes**, G. Asimakopoulos, K. Spyrou, K. C. Vasilopoulos, A. B. Bourlinos, D. Moschovas, A. Avgeropoulos, M. A. Karakassides and D. Gournis. Functional carbon materials derived through hypergolic reactions at ambient conditions. *Nanomaterials* (2020) Vol. 10, No. 3, article 566 (p.p. 13).

B16. **N. Chalmes**, A. B. Bourlinos, S. Talande, A. Bakandritsos, D. Moschovas, A. Avgeropoulos, M. A. Karakassides and D. Gournis. Rapid carbon formation from spontaneous reaction of ferrocene and liquid bromine at ambient conditions. *Nanomaterials* (2020) Vol. 10, No. 8, article 1564 (p.p. 13).

B17. G. Botzolaki, G. Goula, A. Rontogianni, E. Nikolaraki, **N. Chalmes**, P. Zygouri, M. Karakassides, D. Gournis, N.D. Charisiou, M.A. Goula, S. Papadopoulos and I.V. Yentekakis. CO₂ methanation on supported Rh nanoparticles: The combined effect of support oxygen storage capacity and Rh particle size. *Catalysts* (2020) Vol. 10, No. 8, article 944 (p.p. 25).

B18. **N. Chalmes**, A. B. Bourlinos, V. Šedajová, V. Kupka, D. Moschovas, A. Avgeropoulos, M. A. Karakassides and D. Gournis. Hypergolic materials synthesis through reaction of fuming nitric acid with certain cyclopentadienyl compounds. *C -Journal of Carbon Research* (2020) Vol. 6, No. 4, article 61 (pp. 12).

B19. **N. Chalmes**, A. B. Bourlinos, S. Talande, A. Bakandritsos, D. Moschovas, A. Avgeropoulos, M. A. Karakassides and D. Gournis. Nanocarbon from rocket fuel waste: the case of furfuryl alcohol-fuming nitric acid hypergolic pair. *Nanomaterials* (2021) Vol. 11, No. 1, article 1 (pp. 13).

B20. **N. Chalmes**, D. Moschovas, A. B. Bourlinos, I. Tantis, A. Bakandritsos, A. Avgeropoulos, M. A. Karakassides and D. Gournis. Carbon nanostructures derived through hypergolic reaction of conductive polymers with fuming nitric acid at ambient conditions. *Molecules* (2021), Vol. 26, Issue 6, p.p. 1595.

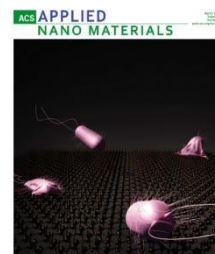
B21. D. Katsigiannopoulos, E. Grana, K.Tsitoni, I. Moutsios, G.M. Manesi, E. A. Nikitina, **N. Chalmpes**, D. Moschovas, D.Gournis, D. A. Ivanov, and A. Avgeropoulos. Structure/properties relationship of anionically synthesized diblock copolymers “Grafted to” chemically modified graphene. *Polymers* (2021), Vol. 13, Issue 14, p.p. 2308.

B22. **N. Chalmpes**, G. Asimakopoulos, M. Baikousi, D. Moschovas, A. Avgeropoulos, A. B. Bourlinos, V. Sedajova, A. Bakandritsos, D. Gournis and M. A. Karakassides. Fast and direct microwave synthesis of carbon from bovine blood waste: a feedstock material for extractive metallurgy, carbon dots production and graphite synthesis. *Journal of Nanotechnology Research* (2021), Vol. 13, p. 011-028.

B23. T. Giousis, G. Potsi, A. Kouloumpis, K. Spyrou, Y. Georgantas, **N. Chalmpes**, K. Dimos, M.-K. Antoniou, G. Papavassiliou, A. B. Bourlinos, H. J. Kim, V. K. S. Wadi, S. Alhassan, M. Ahmadi, B. J. Kooi, G. Blake, D. M. Balazs, M. A. Loi, D. Gournis and P. Rudolf. Synthesis of 2D germanane (GeH): a new, fast, and facile approach. *Angewandte Chemie* (2021), Vol. 133, Issue 1, p. 364-369.

B24. R. Fotiadou, A. V. Chatzikonstantinou, M. A. Hammami, **N. Chalmpes**, D. Moschovas, K. Spyrou, A. C. Polydera, A. Avgeropoulos, D. Gournis and H. Stamatis. Green synthesized magnetic nanoparticles as effective nanosupport for the immobilization of lipase: Application for the synthesis of lipophenols. *Nanomaterials* (2021) Vol. 11, No. 2 (pp. 22).

B25. A. Kouloumpis, A. V. Chatzikonstantinou, **N. Chalmpes**, T. Giousis, G. Potsi, P. Katapodis, H. Stamatis, D. Gournis and P. Rudolf. Germanane monolayer films as antibacterial coatings. *ACS Applied Nano Materials* (2021), Vol. 4, Issue 3, p.p. 2333-2338. [Supplementary Front Cover of Issue 3, Vol. 4 –Journal Cover Art].



B26. A. Giannakopoulou, A. V. Chatzikonstantinou, **N. Chalmpes**, G. Tsapara, D. Gournis, A. C. Polydera and H. Stamatis. Development of a novel bi-enzymatic nanobiocatalyst for the efficient bioconversion of oleuropein to hydroxytyrosol. *Catalysts* (2021), Vol. 11, Issue 6, p.p. 749.

B27. **N. Chalmpes**, A. B. Bourlinos, D. Moschovas, K. Spyrou, A. Avgeropoulos, M. A. Karakassides and D. Gournis. Hypergolic ignition of 1,3-cyclodienes by fuming nitric acid towards the fast and spontaneous formation of carbon nanosheets at ambient conditions *Micro* (2021), Vol. 1, Issue 1, p. 15-27.

B28. **N. Chalmpes**, G. Asimakopoulos, M. Baikousi, A. B. Bourlinos, M. A. Karakassides and D. Gournis. Hypergolic synthesis of inorganic materials by the reaction of metallocene dichlorides with fuming nitric acid at ambient conditions: the case of photocatalytic titania. *Sci* (2021), Vol. 3, Issue 4, pp. 46.

B29. A. Koutsoukakis, K. Spyrou, **N. Chalmpes**, D. Gournis and V. Georgakilas. Hydrothermal unzipping of multiwalled carbon nanotubes and cutting of graphene by potassium superoxide. *Nanomaterials* (2022), Vol. 12, Issue 3, pp.447.

B30. A. Papadopoulou, N. Chalmpes, D. Gournis, Nikoleta Kostopoulou and E. K. Efthimiadou.

Synthesis, characterization and evaluation of aqueous Zn-based quantum dots for bioapplications. *Dalton Transactions* (2022), Vol. 51, p. 3452-3461

B31. N. Kaloudis, P. Zygouri, **N. Chalmpes**, K. Spyrou, D. Gournis and I. V Pavlidis. Effect of graphite oxide on the catalytic behavior of (S)-selective amine transaminases. *Frontiers in Catalysis* (2022), Vol. 1, pp. 803850.

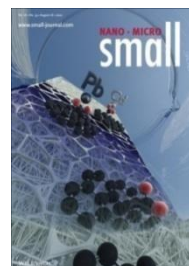
B32. **N. Chalmpes***, M. Baikousi, T. Giouis, P. Rudolf, C. E. Salmas, D. Moschovas, A. Avgeropoulos, A. B. Bourlinos, I. Tantis, A. Bakandritsos, D. Gournis and M. A. Karakassides. Biomass waste carbonization in piranha solution: A route to hypergolic carbons? *Micro* (2022), Vol. 2, Issue 1, p.137-153.

B33. A. P. Stavropoulou, M. Theodosiou, E. Sakellis, N. Boukos, G. Papanastasiou, C. Wang, A. Tavares, C. A. Corral, D. Gournis, **N. Chalmpes**, O. L. Gobbo, E. K. Efthimiadou. Bimetallic gold-platinum nanoparticles as a drug delivery system coated with a new drug to target glioblastoma. *Colloids and Surfaces B: Biointerfaces* (2022), Vol. 214, pp. 112463.

B34. **N. Chalmpes***, G. Asimakopoulos, M. Baikousi, C. E. Salmas, D. Moschovas, A. Avgeropoulos, A. B. Bourlinos, I. Tantis, A. Bakandritsos, D. Gournis and M. A. Karakassides. Microwave synthesis, characterization and perspectives of wood pencil-derived carbon. *Applied Sciences* (2022), Vol. 12, Issue 1, p. 410.

B35. A. B. Bourlinos, **N. Chalmpes**, D. Gournis and M. A. Karakassides. Hypergolic Materials Synthesis: A Review. *Journal of Nanotechnology Research* (2022), Vol. 4, p. 059-096.

B36. D. Panáček, L. Zdražil, M. Langer, Z. Baďura, G. Zoppellaro, V. Šedajová, Q. Yang, E. Nguyen, R. Álvarez, V. Hrubý, J. Kolařík, **N. Chalmpes**, A. B. Bourlinos, M. Pykal, R. Zbořil, A. Merkoçi, A. Bakandritsos and M. Otyepka. Graphene nanobeacons with high-affinity pockets for combined, selective and effective decontamination and reagentless detection of heavy metals. *Small* (2022), Vol. 18, Issue 33, pp.2201003. Cover of Volume 18, Issue 33.



B37. **N. Chalmpes***, M. Patila, A. Kouloumpis, C. Alatzoglou, K. Spyrou, M. Subrati, A. C. Polydera, A. B. Bourlinos, H. Stamatis, D. Gournis. Graphene Oxide-cytochrome c multilayered structures for biocatalytic applications: Decrypting the role of surfactant in Langmuir-Schaefer layer deposition. *ACS Applied Materials and Interfaces* (2022), Vol. 14, Issue 22, p. 26204-26215.

B38. A. Kouloumpis, G. Potsi, T. Giouis, **N. Chalmpes**, D. Gournis, P. Rudolf. Ultrasonic-assisted synthesis of germanane and siloxane nanostructures. *Solid State Phenomena* (2022), Vol. 336, pp. 63-68.

B39. P. Ziogas, A. P. Douvalis, A. B. Bourlinos, C. Papachristodoulou, **N. Chalmpes**, M. A. Karakassides, A. E. Giannakas, C. E. Salmas. Isolation, characterization and hydrogen sulfide H₂S sorption properties at room temperature of magnetite sludge from radiator. *Journal of Nanotechnology Research* (2022), Vol. 4, p. 97-110.

B40. D. Karageorgou, P. Zygouri, T. Tsakiridis, M. A. Hammami, **N. Chalmpes**, M. Subrati, I.

Sainis, K. Spyrou, P. Katapodis, D. Gournis, H. Stamatis. Green synthesis and characterization of silver nanoparticles with high antibacterial activity using cell extracts of cyanobacterium Pseudanabaena/Limnithrix sp. *Nanomaterials* (2022), Vol. 12, Issue 13, pp. 2296.

B41. C. Alatzoglou, M. Patila, A. Giannakopoulou, K. Spyrou, F. Yan, W. Li, **N. Chalmpes**, A.C Polydera, P. Rudolf, D. Gournis, H. Stamatis. Development of a multi-enzymatic biocatalytic system through immobilization on high quality few-layer bio-graphene. *Nanomaterials* (2023), Vol. 13, Issue 1, pp. 127.

B42. A. Rontogianni, **N. Chalmpes**, E. Nikolaraki, G. Botzolaki, A. Androulakis, A. Stratakis, P. Zygouri, D. Moschovas, A. Avgeropoulos, M. A. Karakassides, D. P. Gournis, S. Tsatsos, G. Kyriakou, N. K. Boukos, P. Panagiotopoulou, I.V. Yentekakis. Efficient CO₂ hydrogenation over mono- and bi-metallic RuNi/MCM-41 catalysts: Controlling CH₄ and CO products distribution through the preparation method and/or partial replacement of Ni by Ru. *Chemical Engineering Journal* (2023), Vol.474, pp. 145644.

B43. A. W. Alsmail, S. Mohammed, B. S. Aldakkan, **N. Chalmpes**, A. Kouloumpis, G. Potsi, A. Galvin, G. Gadikota, M. Y. Kanj, E. P. Giannelis. Fine-tuning the surface and interfacial chemistry of silica nanoparticles to control stability in high ionic strength electrolytes and modulate assembly at oil–water interfaces. *Chemistry of Materials* (2023), Vol. 35, p. 9150-9159.

B44. **N. Chalmpes**, A. B Bourlinos, A. W. Alsmail, A. S Aljarrah, C. E Salmas, M. A Karakassides, E. P. Giannelis. First synthesis of 2D materials by hypergolic reactions and evaluation of their dispersions for ink formulation: hexagonal boron nitride and fluorinated carbon nanosheets. *Materials Research Express* (2024), Vol. 11, pp. 035002

B45. B. S. Aldakkan, **N. Chalmpes**, G. Qi, M. A. Hammami, M. Y. Kanj, E. P. Giannelis. Synthesis of raspberry-like nanoparticles via surface grafting of positively charged polyelectrolyte brushes: colloidal stability and surface properties. *Langmuir* (2024), Vol. 40, p. 5837-5849.

B46. M. Theodosiou, **N. Chalmpes**, D. Gournis, E. Sakellis, N. Boukos, M. Kostakis, N. S. Thomaidis, E. K. Efthimiadou. Amino acid driven synthesis of gold nanoparticles: A comparative study on their biocompatibility. *Materials Chemistry and Physics* (2024), Vol. 319, p. 129260.

B47. A. Kechagias, C. E Salmas, **N. Chalmpes**, A. Leontiou, M. A Karakassides, E. P Giannelis, A. E. Giannakas. Laponite vs. Montmorillonite as eugenol nanocarriers for low density polyethylene active packaging films. *Nanomaterials* (2024), Vol. 14, pp. 1938.

B48. J. Lu, W. Wu, F. M. Colombari, A. Jawaid, B. Seymour, K. Whisnant, X. Zhong, W. Choi, **N. Chalmpes**, J. Lahann, R. A. Vaia, A. F. de Moura, D. Nepal, N. A. Kotov. Nano-achiral complex composites for extreme polarization optics. *Nature* (2024), Vol. 630, p. 860-865.

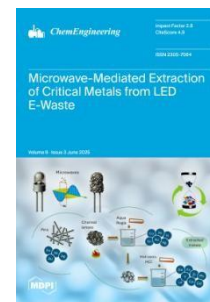
B49. **N. Chalmpes**, I. Tantis, A.W. Alsmail, A. B. Bourlinos, E. P. Giannelis. Design, synthesis and evaluation of noble metal nanoparticle and in-situ decorated carbon supported nanoparticle electrocatalysts using hypergolic reactions. *Chemistry of Materials* (2024), Vol. 36, p. 10616-10625.

B50. N. Chalmpes*, P. Ochonma, I. Tantis, A. W. Alsmacil, T. E. Assafa, M. Tathacharya, M. Srivastava, G. Gadikota, A. B. Bourlinos, T. Steriotis, E. P. Giannelis. Ultrahigh surface area nanoporous carbons synthesized via hypergolic and activation reactions for enhanced CO₂ capacity and volumetric energy density. *ACS Nano* (2024), Vol. 18, p. 33491–33504.

B51. Y. D. R. Machado, G. A. Prando, L. F. Araújo, L. V. da Sila, M. O. Sales, D. Grasseschi, W. Margulis, **N. Chalmpes**, R. A. Vaia, A. S. L. Gomes, I. C.S. Carvalho. Electric-field induced instability of redox-exfoliated layered transition metal dichalcogenides. *The Journal of Physical Chemistry C* (2025), Vol. 129, p. 2582–2589.

B52. A. B. Bourlinos, **N. Chalmpes**, E. P. Giannelis, D. P. Gournis, D. Moschovas, A. Avgeropoulos, C. Salmas, M. A. Karakassides. Total recycling of copper cable scrap and production of carbon using fast microwave technology. *Eng* (2025), Vol. 6, p.74. [Cover of Volume 6, Issue 4, April 2025].

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4C. Publications in Book Series (refereed)

C1. M. Patila, **N. Chalmpes**, E. Dounousi, H. Stamatis, D. Gournis. Use of functionalized carbon nanotubes for the development of robust nanobiocatalysts. *Methods in Enzymology* (2020), Vol. 630, p. 263-301 (Invited Chapter; Volume topic: Nanoarmoring of Enzymes with Carbon Nanotubes and Magnetic Nanoparticles, Edited by C. V. Kumar, Chapter 12).

C2. A. Giannakopoulou, M. Patila, **N. Chalmpes**, A. C. Polydera, D. Gournis, H. Stamatis. A four-enzyme nanoassembly consisting of hydrolases and oxidoreductases for multi-step cascade reactions. *Methods in Molecular Biology* (2022), Vol. 2487, p. 263-278. (Invited Chapter, Volume topic: Multienzymatic Assemblies, Edited by H. Stamatis, Chapter 16).

4D. International Patents

D1. Porous carbon materials, methods of making same and uses thereof.

Inventors: **N. Chalmpes** and E. P. Giannelis

Application number: PCT/US25/17036, Attorney Docket: CRNL-110-B-WO

D2. Metal nanoparticles and materials, methods of making same and uses thereof.

Inventors: **N. Chalmpes** and E. P. Giannelis

Application number: 63/708,522, Attorney Docket: 018617.01838

D3. Methods of making exfoliated transition metal chalcogenides and exfoliated transition metal mhalcogenides and uses of same.

Inventors: **N. Chalmpes**, E. P. Giannelis, M. Susner, A. Jawaaid, R. A. Vaia

Application number: 63/740,493, Attorney Docket: COUN-010.

D4. Ion source and electrospray based on nanoparticle ionic materials and associated methods.

Inventors: S. Bell, **N. Chalmpes**, C. Geiger, E. P. Giannelis, E. Petro

Appl. Number: 63/741,713 Attorney Docket: CRNU.P2059P1/00629154.