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## Development and study of low-dimensional hybrid and nanocomposite materials based on layered nanostructures

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# Publications

During these past six years I have contributed to 28 projects. The ones I have chosen to include in this dissertation are marked with \*.

1. *Gd(III)-doped carbon dots as a dual fluorescent-MRI probe*, A. B. Bourlinos, A. Bakandritsos, A. Kouloumpis, D. Gournis, M. Krysmann, E. P. Giannelis, K. Polakova, K. Safarova, K. Hola, R. Zboril, *Journal of Materials Chemistry*, (2012) 22, 44, 23327-23330.

2. *Aqueous-dispersible fullerol-carbon nanotube hybrids*, A. B. Bourlinos, V. Georgakilas, A. Bakandritsos, **A. Kouloumpis**, D. Gournis, R. Zboril, *Materials Letters* (2012) 82, 48-50.

3. *Synthesis, characterization and non-linear optical response of organophilic carbon dots*, A. B. Bourlinos, M. A. Karakassides, **A. Kouloumpis**, D. Gournis, A. Bakandritsos, I. Papagiannouli, P. Aloukos, S. Couris, K. Hola, R. Zboril, M. Krysmann, E. P. Giannelis, *Carbon*, (2013) 61, 640-643.

4. *Tuning the Dispersibility of Carbon Nanostructures from Organophilic to Hydrophilic: Towards the Preparation of New Multipurpose Carbon-Based Hybrids*, V. Georgakilas, **A. Kouloumpis**, D. Gournis, A. Bourlinos, C. Trapalis, R. Zboril, *Chemistry - A European Journal*, (2013) 19, 12884-12891.

5. *Wetting behavior of plasma treated low-k films in dHF cleans solutions*, T.S. Smith, K.M. Lynch, C.M. Cooper, O. Okobiah, E. Osei-Yiadom, M. Bischof, **A. Kouloumpis**, M. Baikousi, K. Dimos, R.F. Reidy, *Microelectronic Engineering* 128 (2014) 79-84.

6. *Performance of layer-by-layer deposited low dimensional building blocks of graphene-prussian blue onto graphite screen-printed electrodes as sensors for hydrogen peroxide*, A. Michopoulos, **A. Kouloumpis**, D. Gournis, M. I. Prodromidis, *Electrochimica Acta* 146 (2014) 477-484.

7. *Green and simple route toward boron doped carbon dots with significantly enhanced non-linear optical properties*, A. B. Bourlinos, G. Trivizas, M. A. Karakassides, M. Baikousi, **A. Kouloumpis**, D. Gournis, A. Bakandritsos, K. Hola, O. Kozak, R. Zboril, I. Papagiannouli, P. Aloukos, S. Couris, *Carbon* 83 (2015) 173-179.

8. *Hydrophilic nanotube supported graphene-water dispersible carbon superstructure with excellent conductivity*, V. Georgakilas, A. Demeslis, E. Dararas, **A. Kouloumpis**, K. Dimos, D. Gournis, M. Kocman, M. Otyepka, R. Zboril, *Advanced Functional Materials*, 25 (10) (2015) 1481-1487.

9.\* *A bottom-up approach for the synthesis of highly ordered fullerene-intercalated graphene hybrids*, **A. Kouloumpis**, K. Spyrou, K. Dimos, V. Georgakilas, P. Rudolf, D. Gournis, *Frontiers in Materials* (2015), 2, 10.

10. *In situ growth of capping-free magnetic iron oxide nanoparticles on liquid-phase exfoliated graphene*, T. Tsoufis, Z. Syrgiannis, N. Akhtar, M. Prato, F. Katsaros, Z. Sideratou, **A. Kouloumpis**, D. Gournis, P. Rudolf, *Nanoscale*, (2015) 7, 8995-9003.

11. *Highly dispersible disk-like graphene nanoflakes*, V. Georgakilas, K. Vrettos, K. Katomeri, **A. Kouloumpis**, K. Dimos, D. Gournis and R. Zborilc, *Nanoscale*, (2015), 7, 15059.

12. *Introduction of micronuclei by multi-walled carbon nanotubes interacting with humic acids in cultured human*, M. S. Vidali, E. Bletsas, **A. Kouloumpis**, C. G. Skoutelis, Y. Deligiannakis, D. Gournis, D. Vlastos, *Environ. Sci.: Nano*, (2016) 3, 74.

13. *Carbon nanostructures containing polyhedral oligomeric silsesquioxanes (POSS)*, G. Potsi, A. Rossos, **A. Kouloumpis**, M. K. Antoniou, K. Spyrou, M. A. Karakassides, D. Gournis, P. Rudolf, *Current Organic Chemistry*, (2016) 20(6): 662-673.

14. *Functionalized graphene oxide nanomaterials as supports for stabilization of cytochrome c*, M. Patila, I. V. Pavlidis, **A. Kouloumpis**, K. Dimos, K. Spyrou, P. Katapodis, D. Gournis, H. Stamatis, *International Journal of Biological Macromolecules*, (2016), 84, 227-235.

15. *Laccase-functionalized graphene oxide assemblies as efficient nanobiocatalysts for oxidation reactions*, M. Patila, **A. Kouloumpis**, D. Gournis, P. Rudolf, H. Stamatis, *Sensors (Basel)*, (2016), 16 (3), 287.
16. *Unexpected orbital magnetism in Bi-rich Bi<sub>2</sub>Se<sub>3</sub> nanoplatelets*, H. J. Kim, M. S. Katsiotis, S. Alhassan, I. Zafiropoulou, M. Pissas, Y. Sanakis, G. Mitrikas, N. Panopoulos, N. Boukos, V. Tzitzios, M. Fardis, J. G. Kim, S. G. Lee, Y. M. Kim, S. J. Yoo, J. H. Lee, **A. Kouloumpis**, D. Gournis, M. Karakassides, G. Papavassiliou, *NPG Asia Mater* (2016), 8, e271.
17. *Determination of phenolic compounds using spectral and color transitions of rhodium nanoparticles*, V. Gatselou, D. C. Christodouleas, **A. Kouloumpis**, D. Gournis, D. L. Giokas, *Analytica Chimica Acta*, (2016), 932, 80-87.
18. *Graphene nanobuds: synthesis and selective organic derivatisation*, V. Georgakilas, A. B. Bourlinos, E. Ntararas, A. Ibraliu, D. Gournis, K. Dimos, **A. Kouloumpis**, R. Zboril, *Carbon* (2016), 110, 51-55.
19. *Fe(III)-functionalized carbon dots - highly efficient photoluminescence redox catalyst for hydrogenations of olefins and decomposition of hydrogen peroxide*, A. B. Bourlinos, A. K. Rathi, M. B. Gawande, K. Hola, A. Goswami, S. Kalytchuk, M. A. Karakassides, **A. Kouloumpis**, D. Gournis, Y. Deligiannakis, E. P. Giannelis, R. Zboril, *Applied Materials Today* (2017), 7, 179-184.
- 20.\* *Graphene/Carbon-dot hybrid thin films prepared by a modified Langmuir-Schaefer method*, **A. Kouloumpis**, E. Thomou, N. Chalmpes, K. Dimos, K. Spyrou, A. B. Bourlinos, I. Koutselas, D. Gournis, P. Rudolf, *ACS Omega* (2017), 2 (5), 2090-2099.
21. *Fullerol-Graphene Nanobuds: Novel Water Dispersible and Highly Conductive Nanocarbon for Electrochemical Sensing*, A. B. Bourlinos, V. Georgakilas, V. Mouselimis, **A. Kouloumpis**, E. Mouzourakis, A. Koutsioukis, M-K. Antoniou, D. Gournis, M. A. Karakassides, Y. Deligiannakis, V. Urbanova, K. Cepe, A. Bakandritsos, R. Zboril, *Applied Materials Today* (2017), 9, 71-76.

22. *Top-down and bottom-up approaches to transparent, flexible and luminescent nitrogen-doped carbon nanodots-clay hybrid films*, K. Dimos, F. Arcudi, **A. Kouloumpis**, I. Koutselas, P. Rudolf, D. Gournis, M. Prato, *Nanoscale* (2017), DOI: 10.1039/C7NR02673K

23. *Hydrophilic oxidized carbon nanodiscs: A promising multifunctional material for bioapplications*, P. Zygouri, T. Tsoufis, **A. Kouloumpis**, M. Patila, G. Potsi, A. A. Sevastos, Z. Sideratou, F. Katsaros, G. Charalambopoulou, H. Stamatis, P. Rudolf, T. A. Steriotis, Dimitrios Gournis. **(Submitted)**

24.\* *Controlled deposition of fullerene derivatives within a graphene template by means of a modified Langmuir-Schaefer method*, **A. Kouloumpis**, N. Vourdas, P. Zygouri, V. Kostas, N. Chalmpes, G.Potsi, K. Spyrou, V. Stathopoulos, P. Rudolf, D. Gournis. **(Submitted)**

25.\* *Synthesis of 2D germanane (GeH): a new, fast and facile approach*, T. Giousis, G. Potsi, **A. Kouloumpis**, K. Spyrou, N. Chalmpes, K. Dimos, M. K. Antoniou, G. Papavassiliou, A. Bourlinos, H. J. Kim, H. Stamatis, G. Blake, D. Gournis, P. Rudolf. **(to be submitted)**

26.\* *Extraordinary antimicrobial activity of germanane monolayer films*, **A. Kouloumpis**, N. Vourvou, N. Chalmpes, T. Giousis, P. Katapodis, H. Stamatis, P. Rudolf, D. Gournis. **(to be submitted)**

27. *In-situ formation of molecularly thin Mn-Fe Prussian Blue analogues on a layered double hydroxide monolayer by means of a Langmuir-Schaefer approach*, M. Katsiaflaka, **A. Kouloumpis**, R. Y. N. Gengler, G. Potsi, K. Spyrou, M. Prodromidis, A. Siozios, P. Patsalas, R. J. D. Miller, D. Gournis. **(to be submitted)**

## BOOK CHAPTERS

1.\* **A. Kouloumpis**, P. Zygouri, K. Dimos, D. Gournis, (2014) *Layer-by-layer assembly of graphene-based hybrid materials*, 2014, (ed. V. Georgakilas), Chapter 11, pp. 359-399, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, ISBN-9783527672790, DOI: 10.1002/9783527672790. **(Invited)**