MARINA KARAGIANNI

Research associate, NMR laboratory, Institute of Nanoscience and Nanotechnology (INN), NCSR "DEMOKRITOS", Athens, Greece
Tel: (0030) 6503352 **E-mail:** m.karagianni@inn.demokritos.gr

Dr. Marina Karagianni is an experienced research associate of the NMR lab of the NCSR "Demokritos". She received her B. Sc. in Physics, in 1990 from the Department of Physics, National and Kapodistrian University of Athens and her PhD in the Physical Science in 1998 from the School of Applied Mathematical and Physical Science of the National Technical University of Athens. She has been awarded a 4-year scholarship (March 1991- Sept 1995) for Ph.D. dissertation, after written examinations at the Institute of Materials Science of NCSRD. The research work of her PhD thesis was implemented in the NMR lab of the NCSR "Demokritos" where she gained experience and skills in advanced methodologies and NMR techniques, in NMR hardware (development of home-build NMR spectrometers) and in low temperature measuring devices and techniques.

Since 1998 she has been working as a research collaborator of the NMR lab through National and European funded research projects. Also, since 2002 she has been collaborating with the Technological Educational Institutions (TEI) of Athens and Piraeus as a lab assistant and as a teacher of Physics courses at the Dept. of Electronics Engineering, of TEI of Piraeus. Currently she is working in the project *"Carbon Nanotubes for Water Transport" (CIRA-2020-051),* a Competitive Internal Research Award (CIRA) funded by the Khalifa University (United Arab Emirates). Her scientific activities include:

(i) NMR studies of flow dymamics and transport phenomena of liquids confined in nano-porous materials, (ii) Studies of transition metal phosphide nanocatalysts with solid state NMR nanocrystallography methods, in the study of structural and electronic properties. (iii) Implementation of advanced NMR methodologies in the study of innovative nanoparticles and nanocatalysts for oilfield applications, (iv) NMR studies of photoelectrochemical cells and of strongly coupled electron systems (superconducting (MgB2) and electron-enriched derivatives (Na_xCoO_2 , 0 <x <1) systems).

She has co-authored 21 publications in international peer-reviewed journals and has an h-Index: 8 (Scopus March 2021).

List of Publications:

1) "Dynamic molecular ordering in multiphasic nanoconfined ionogels detected with time-resolved diffusion NMR", **Karagianni, M.**, Gkoura, L., Tsolakis, N., Romanos, G., Orfanidis, S., Panopoulos, N., Alhassan, S., Chatzichristos, A., Hassan, J., Fardis, M., Papavassiliou, G.*,
PPR: PPR440207 DOI: 10.21203/rs.3.rs-1052911/v1 http://europepmc.org/abstract/PPR/PPR440207

2) "Detection of Weyl Fermions and the Metal to Weyl-Semimetal phase transition in WTe_2 via broadband High Resolution NMR", Papawassiliou, W., Carvalho, J. P., Kim, H.J., Kim, C-Y., Yoo, S.J., Lee, J. B., Alhassan, S., Orfanidis, S., Psycharis, V., **Karagianni, M.,** Fardis, M., Panopoulos, N., Papavassiliou, G., Pell, A.J., arXiv:2110.01300 **[cond-mat.mtrl-sci].**

3) "Crystal and electronic facet analysis of ultrafine Ni_2P particles by solid-state NMR nanocrystallography", Papawassiliou, W., Carvalho, J.P., Panopoulos, N., Alwahedi, Y., Wadi V. K. S., Lu X., Polychronopoulou, K., Lee, J-B., Lee, S-G., Kim C-Y., Hae Jin Kim, H-J., Katsiotis, M., Tzitzios, V., **Karagianni, M**., Fardis, M., Papavassiliou, G.*, and Pell, A.J., ***Nature Communications 12,*** 4334 (2021). https://doi.org/10.1038/s41467-021-24589-5.

4) "Ni_2P Nanoparticles Embedded in Mesoporous SiO_2 for Catalytic Hydrogenation of SO_2 to Elemental S", Lu, X.; Baker, M. A.; Anjum, D. H.; Basina, G.; Hinder, S. J.; Papawassiliou, W.; Pell, A. J.; **Karagianni, M.**; Papavassiliou, G.; Shetty, D.; Gaber, D.; Gaber, S.; Al Wahedi, Y.; Polychronopoulou, K., ***ACS Appl. Nano Mater. 4 (6)***, 5665–5676 (2021). https://doi.org/10.1021/acsanm.0c02853.

5) "Resolving Dirac electrons with broadband high-resolution NMR", Papawassiliou, W., Jaworski, A., Pell, A.J., Jang, J.H., Kim, Y., Lee, S.-C., Kim, H.J., Alwahedi, Y., Alhassan, S., Subrati, A., Fardis, M., **Karagianni, M.,** Panopoulos, N., Dolinšek, J., Papavassiliou, G., ***Nature Communications 11,*** 1285 (2020). https://doi.org/10.1038/s41467-020-14838-4.

6) "The Role of Titanium Dioxide on the Hydration of Portland Cement: A Combined NMR and Ultrasonic Study", Diamantopoulos, G., Katsiotis, M., Fardis, M., Karatasios, I., Alhassan, S., **Karagianni, M.,** Papavassiliou, G., Hassan, J., ***Molecules, 25***, 5364 (2020), https://doi.org/10.3390/molecules25225364

7) "The peculiar size and temperature dependence of water diffusion in carbon nanotubes studied with 2D NMR diffusion-relaxation D-T 2 effspectroscopy", Gkoura, L., Diamantopoulos, G., Fardis, M., Homouz, D., Alhassan, S., Beazi-Katsioti, M., **Karagianni, M.,** Anastasiou, A., Romanos, G., Hassan, J., Papavassiliou, G., ***Biomicrofluidics 14***, 034114 (2020); https://doi.org/10.1063/5.0005398 and **AIP Scilight** (https://aip.scitation.org/doi/10.1063/10.0001492)

8) "^{1}H NMR tests on damaged and undamaged XLPE and SiR samples", L. Gkoura, T. Wang, A. Anastasiou, N. Harid , H. Griffiths, M. Haddad, M. Fardis, M. Karayianni, ***IET Journals*** 2019, https://doi.org/10.1049/hve.2019.0077

9) "NMR and EPR Structural Analysis and Stability Study of Inverse Vulcanized Sulfur Copolymers", Shankarayya Wadi, V.K., Jena, K.K., Khawaja, S.Z., Yannakopoulou, K., Fardis, M., Mitrikas, G., **Karagianni, M**., Papavassiliou, G., Alhassan, S.M., ***ACS Omega, 3***, 3330–3339 (2018), https://pubs.acs.org/doi/10.1021/acsomega.8b00031.

10) "Ultrafast Stratified Diffusion of Water Inside Carbon Nanotubes; Direct Experimental Evidence with 2D D-T2 NMR Spectroscopy", Hassan, J., Diamantopoulos, G., Gkoura, L., Karagianni, M., Alhassan, S., Kumar, S.V., Katsiotis, M.S., Karagiannis, T., Fardis, M., Panopoulos, N., Kim, H.J., Beazi-Katsioti, M., Papavassiliou, G., ***Journal of Physical Chemistry C, 122 (19)***, pp. 10600-10606 (2018), https://pubs.acs.org/doi/10.1021/acs.jpcc.8b01377

11) "^{11}B NMR study of pure and lightly carbon – doped MgB_2 superconductors", **Karayanni M.**, Papavassiliou G., Pissas M. et al., ***J. Supercond. 18(4)***, 521-528 (2005), https://link.springer.com/article/10.1007%2Fs10948-005-0035-9

12) "Modification of TiO_2 semiconductor with molecules bearing functional phosphonic groups: a ^{31}P solid state NMR study", P. Falaras, I. M. Arabatzis, T. Stergiopoulos, G. Papavassiliou, **M. Karagianni**, Journal of Materials Processing Technology 161 (1-2 SPEC. ISS.), pp. 276-281 (2005), https://doi.org/10.1016/j.jmatprotec.2004.07.036

13) " Spin-polarized oxygen hole states in cation-deficient $La_{1-x}Ca_xMnO_{3+\delta}$", G. Papavassiliou, M. Pissas, M. Belesi, M. Fardis, **M. Karayanni**, J. P. Ansermet, D. Carlier, C. Dimitropoulos and J. Dolinsek, ***Europhysics Letters 68 (3)***, 453-459 (2004), https://doi.org/10.1209/epl/i2004-10233-3

14) "A nearly symmetric trinuclearchromium oro carboxylate assembly: preparation, molecular and crystal structure, and magnetic properties of $[Cr_3O(O_2CPh)_6(MeOH)_3](NO_3)2MeOH$", A. Vlachos, V. Psycharis, C. P. Raptopoulou, N. Lalioti, Y. Sanakis, G. Diamantopoulos, M. Fardis, **M. Karayanni**, G. Papavassiliou, A. Terzis, ***Inorganica Chimica Acta 357***, 3162-3172, (2004), https://doi.org/10.1016/j.ica.2004.04.005

15) "^{11}B and ^{27}Al NMR spin-lattice relaxation and Knight shift of $Mg_{1-x}Al_xB_2$: Evidence for an anisotropic Fermi surface", G. Papavassiliou, M. Pissas, **M. Karayanni**, M. Fardis, S. Koutandos, and K. Prassides, ***Physical Review B 66***, 1405141-1405144 (2002), https://doi.org/10.1103/PhysRevB.66.140514.

16) "Magnetization and ^{11}B NMR study of $Mg_{1-x}Al_xB_2$ superconductors", M. Pissas, G. Papavassiliou, **M. Karayanni**, M. Fardis, I. Maurin, I. Margiolaki, K. Prassides, and C. Christides, ***Physical Review B 65***, 1845141-1845145 (2002), https://doi.org/10.1103/PhysRevB.65.184514.

17) "^{11}B NMR detection of the magnetic field distribution in the mixed superconducting state of MgB_2", G. Papavassiliou, M. Pissas, M. Fardis, **M. Karayanni**, C. Christides, ***Physical Review B 65***, 012510 (2002), https://doi.org/10.1103/PhysRevB.65.012510

18) "^{1}H NMR investigation of the spin dynamics of the spin-frustrated trinuclear Fe cluster $(NH_4)[Fe_3(\mu_3\text{-}OH)(H_2L)_3(HL)_3]$ (H_3L=orotic acid)", M. Fardis, G. Diamantopoulos, **M. Karayianni**, G. Papavassiliou, V. Tangoulis, A. Konsta, ***Physical Review B 65***, 014412 (2002), https://doi.org/10.1103/PhysRevB.65.014412

19) "Protonic inter-H-bond motion and ionic conductivity in hydrogen bonded proton glasses", **M. Karayanni**, G. Papavassiliou, M. Fardis, F. Milia, J. Dolinsek, ***Physical Review B 59 (5)***, 3534 (1999), https://doi.org/10.1103/PhysRevB.59.3534

20) "Protonic conductivity in KH_2PO_4 family studied by NMR", J. Dolinsek, **M. Karayanni**, G. Papavassiliou, ***Solid State Ionics 125***, 159 (1999), https://doi.org/10.1016/S0167-2738(99)00170-8.

21) "Two Dimensional NQR Separation of Inhomogeneous and Homogeneous Lineshapes in Disordered Solids", J. Dolinsek, F. Milia, G. Papavassiliou, G.Papantopoulos, **M. Karayianni**, ***Applied Magnetic Resonance 6***, 499 (1994).

22) *"Evaluation of the wettability and the petrophysical properties in carbonate reservoirs by advanced NMR and MRI techniques", Matenoglou, G., Kelessidis, V.C., Garcia, A.P., Heidari, Z., Fardis, M., **Karayanni, M.**, Maris, T.G., Conference Paper, Society of Petroleum Engineers - Abu Dhabi International Petroleum Exhibition and Conference 2016, 2016-January, https://doi.org/10.2118/183531-MS.*

Presentations in International and National Conferences

Oral Presentations

1. Karagianni Marina, “Tracking Ferrofluids beneath Earth Surface: A novel EM Tomography Method for HR Imaging of Oil Reservoirs”, 8th Workshop on "Current trends in Molecular and Nanoscale Magnetism", 27-31 May 2019, Rhodes Greece.
2. Karagianni Marina, “NMR investigations of the structural stability of Sulfur Copolymers prepared by the Inverse Vulcanization Technique”, *8th North America-Greece-Cyprus Workshop on Paramagnetic Materials*, 18-22 June 2018, Sparta Greece.
3. M. Karagianni, “Solid State NMR Spectroscopy - Applications”, Presentation and lab demonstration in the Training Workshop on Advanced Materials Characterisation Techniques, 27-28 November 2015, NCSR Demokritos, Athens, Greece.
4. «Μετρήσεις NMR στους υπεραγωγούς MgB_2, $Mg_{1-x}Al_xB_2$, $MgB_{2-x}C_x$», Καραγιάννη Μ., Γαρδικιώτης Α., Παπαβασιλείου Γ., Πίσσας Μ., Φαρδής Μ., Παπαγγελής Κ., Πρασσίδης Κ., Προφορική παρουσίαση (ομιλία) στο ΧΧ Πανελλήνιο Συνέδριο Φυσικής Στερεάς Κατάστασης – Επιστήμης Υλικών, Πανεπιστήμιο Ιωαννίνων, Σεπτέμβριος 2004.

Posters

1. "The Peculiar Size and Temperature Dependence of Water Diffusion in Carbon Nanotubes studied with 2D NMR Diffusion–Relaxation D–T2eff Spectroscopy", M.Karagianni, L. Gkoura, M.Fardis and G. Papavassiliou, Virtual 62nd ENC Conference, March 29-31, 2021.
2. "^{1}H NMR Study of the Local Magnetic Field Gradients in Evoluting Porous Structures. An Application to Cement Gels", A. Leventis, M. Karayianni, G. Papavassiliou, M. Fardis, F. Milia, Ampère Summer School on Applications of Magnetic Resonance in Novel Materials, Ναύπλιον, Σεπτέμβριος 2000.
3. "Nuclear Quadrupole and Nuclear Magnetic Resonance in Weakly Substitutionally Disordered Pseudospin Proton Glasses", F. Milia, G. Papantopoulos, M. Karayianni and G. Papavassiliou, Conference on Solid State Physics and Novel Materials, Luxor Egypt, November 1997.
4. "^{87}Rb and ^{75}As NMR and NQR Studies of $Rb_{1-x}(NH_4)_xH_2AsO_4$ in the Weak Disorder Limit", M. Karayianni, G. Papantopoylos, G. Papavassiliou, and F. Milia, 12th Specialised Colloque Ampère, Κέρκυρα, Σεπτέμβριος 1995.
5. "Magnetic Resonance Diffusion Imaging of the Human Brain", G. Papavassilou, F. Milia, G. Papantopoulos, M. Fardis, and M. Karayanni, Ampère Summer Institute on Advanced Techniques in Experimental Magnetic Resonance, Portoroz Slovenia, Sept. 1993.
6. "1D and 2D 75As NQR Studies in Rb1-x(NH4)H2AsO4 for x=0.01 and x=0.02, G. Papantopoulos, G. Papavassiliou, F. Milia, M. Karayianni, R. Rumm, R. Blinc, B. Zalar, J. Dolinsek, Ampère Summer Institute on Advanced Techniques in Experimental Magnetic Resonance, Portoroz Slovenia, Sept. 1993.