UNIVERSITATEA DIN CRAIOVA
ȘCOALA DOCTORALĂ DE ȘTIINȚE
TEME CERCETARE DOCTORALĂ
ADMITERE, SESIUNEA SEPTEMBRIE 2026

Propuneri pentru temele/direcțiile de cercetare doctorală, în vederea înscrierii la colocviul de admitere pentru anul universitar 2026-2027, anul I de studii doctorale

I. Domeniul Chimie

1. ***Evaluarea acțiunii reducătoare a sulfurilor de fier/ Assessing the reducing activity of iron sulfides***

   Bibliografie

   a. Sulfide Mineralogy and Geochemistry, Editor David J. Vaughan, editor, Reviews in Mineralogy & Geochemistry, Volume 61.
   b. P. Chirita, M. Descostes, M.L. Schlegel, Oxidation of FeS by oxygen-bearing acidic solutions, Journal of Colloid Interface Science, 321; 2008: 84-95.

II. Domeniul Fizică

1. ***Metode analitice și computaționale pentru investigarea sistemelor dinamice neliniare/ Analytical and computational methods for investigating nonlinear dynamical systems***

   Bibliografie

   a. Arrowsmith D. K., Place C. M. An introduction to dynamical systems, University press, Cambridge, 1994.
   b. Olver, P.J. Applications of Lie Groups to Differential Equations, GTM 107, 2nd ed.; Springer-Verlag: New York, USA, 1993.
   c. Bluman G.W., Cheviakov A.F., Anco S.C.: Applications of Symetry Methods to Partial Diferential Equations. Springer, New York, 2010.
   d. Polyanin, Andrei D., and Valentin F. Zaitsev. Handbook of nonlinear partial differential equations: exact solutions, methods, and problems. Chapman and Hall/CRC, 2003.
   e. Langtangen, Hans Petter. "Solving nonlinear ODE and PDE problems." Center for Biomedical Computing, Simula Research Laboratory and Department of Informatics, University of Oslo, 2016.
2. ***Amplitudini de împrăștiere și vertexuri de interacție/ Scattering amplitudes and interaction vertices***

   Bibliografie

   a. H. Elvang, Y.T Huang, Scattering amplitudes in gauge theory and gravity, Cambridge University Press, Cambridge, 2015
   b. N. Arkani-Hamed, J. Bourjaily, F. Cachazo, A. Goncharov, A. Postnikov, J. Trnka, Grassmannian geometry of scattering amplitudes, Cambridge University Press, Cambridge, 2015

Aprobat în ședința Consiliului Școlii Doctorale de Științe din 16/03/2026

c. C. Cheung, TASI Lectures on Scattering Amplitudes, preprint, arxiv: 1708.03872

3. Metode de construcție a interacțiunilor în teoriile cu simetrii de etalonare

Bibliografie

a. S. Deser, Self-interaction and gauge invariance, General Relativity and Gravitation **1** (1970) 9–18, https://doi.org/10.1007/BF00759198

b. R. Banerjee, Dual description of gauge theories from an iterative Noether approach, Nuclear Physics B **981** (2022) 115875, https://doi.org/10.1016/j.nuclphysb.2022.115875

c. G. Barnich, F. Brandt, M. Henneaux, Local BRST cohomology in gauge theories, Physics Reports **338** (2000) 439–569, https://doi.org/10.1016/S0370-1573(00)00049-1

d. C. Bizdadea, Consistent interactions in the Hamiltonian BRST formalism, Acta Physica Polonica B **32** (2001) 2843 – 2862, https://arxiv.org/pdf/hep-th/0003199

e. S. O. Saliu, E. M. Cioroianu,C. Bizdadea, Various aspects of lower dimensional BF models: Cross-couplings to matter, in TIM20-21 Physics Conference, eds. A. Popescu, M. Lungu, A. Vanciu Rau, AIP Conf. Proc. 2843, 020001, American Institute of Physics: New York, NY, USA, 2023, https://doi.org/10.1063/5.0150599

III. Domeniul Geografie

1. Integrarea modelelor de evaluare a impactului activităților antropice asupra calității mediului marin în managementul adaptiv al zonei costiere românești

Bibliografie

a. Von Schuckmann, K., Le Traon, P. Y., Smith, N., Pascual, A., Brasseur, P., Fennel, K., et al. (2018). Copernicus marine service ocean state report. Journal of Operational Oceanography, 11(sup1), S1-S142. DOI: 10.1080/1755876X.2018.1489208

b. BSC, 2019. State of the Environment of the Black Sea (2009-2014/5). Edited by Anatoly Krutov. Publications of the Commission on the Protection of the Black Sea Against Pollution (BSC) 2019, Istanbul, Turkey, 811 pp. https://www.blackseacommission.org/SoE2009-2014/SoE2009-2014.pdf

c. Maccarrone, V., Scandura, P., & La Rosa, S. D. (2024). The Integrated Coastal Zone Management in the Anthropocene. In *Coastal Sustainability: Insights from Southeast Asia and Beyond* (pp. 1-20). Cham: Springer Nature Switzerland. Maccarrone, V., Scandura, P., La Rosa, S.D. (2024). The Integrated Coastal Zone Management in the Anthropocene. In: Maccarrone, V., Fadzil Akhir, M. (eds) Coastal Sustainability. Coastal Research Library, vol 39. Springer, Cham. DOI: 10.1007/978-3-031-75749-5_1

d. Sagar, S., Tan, P., Lymburner, L., Roberts, D., & Australia, G. (2016). Coastal change detection tools utilising 28 years of Earth Observation data in the Australian Geoscience Data Cube (AGDC). https://www.nespmarine.edu.au/system/files/C3%20-%20Coastal%20change%20detection%20tools%20utilising%2028%20years%20of%20Ear

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IV. Domeniul Matematică

1. *Elemente de optimizare matematică în inteligența artificială/ Elements of mathematical optimization in artificial intelligence*

Bibliografie

a. Bauschke, H. H., & Combettes, P. L. (2017). Convex Analysis and Monotone Operator Theory in Hilbert Spaces (2nd ed.). Cham: Springer. 620 p.
b. Barbu, V. (1984). Optimal Control of Variational Inequalities. Boston: Pitman. 244 p.
c. Beck, A. (2017). First-Order Methods in Optimization. Philadelphia: SIAM. 271 p.
d. Boyd, S., & Vandenberghe, L. (2004). Convex Optimization. Cambridge: Cambridge University Press. 716 p.
e. Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep Learning. Cambridge, MA: MIT Press. 775 p.
f. Nesterov, Y. (2004). Introductory Lectures on Convex Optimization: A Basic Course. Boston: Springer. 211 p.
g. Rockafellar, R. T. (1970). Convex Analysis. Princeton: Princeton University Press. 451 p.
h. Shalev-Shwartz, S., & Ben-David, S. (2014). Understanding Machine Learning: From Theory to Algorithms. Cambridge: Cambridge University Press. 410 p.

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