

MIRCEA-ODIN APOSTU

Research Areas/Interest

- Synthesis and physicochemical characterization of single crystals with special properties
- Experimental and theoretical studies of phase transitions
- Study of polymeric membranes
- Synthesis and characterization of nanocomposite materials

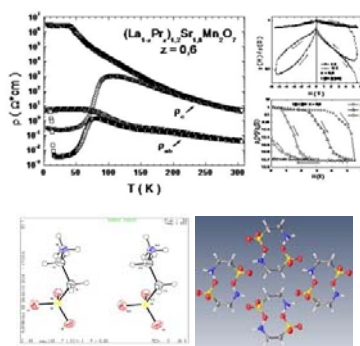
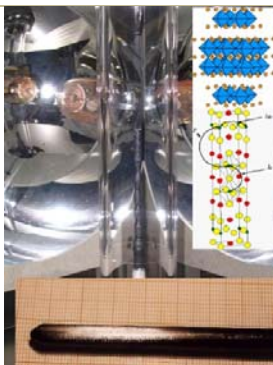
Synthesis and physicochemical characterization of single crystals with special properties (manganese oxides with Ruddlesden-Popper $(AMnO_3)_n(AO)$ type structure – some of those oxides presents the phenomena of colossal magneto-resistance (CMR) essentially due to a strong coupling between magnetic and electric properties; single crystals growth using floating zone technique at

high pressure – up to 100 bar, i.e. $CuO, Ca_{2+x}Y_{2-x}Cu_5O_{10}$.

Study of magnetic and electric phase transitions in $(La_{1-z}Pr_z)_{1.2}Sr_{1.8}Mn_2O_7$ type single crystals.

Study of polymeric membranes based on polyurethane, poly lactate urethane, poly hydroxy urethane and chitosan.

Synthesis and characterization of PbSe, CdSe, TiO_2 type nanocrystals dispersed in polymer matrix/solution.



Publications (selection)

Trinckauf, J; Hanke, T; Zabolotnyy, V; Ritschel, T; **Apostu, MO**; Suryanarayanan, R; Revcolevschi, A; Koepf, K; Kim, TK; von Zimmermann, M; Borisenko, SV; Knupfer, M; Buchner, B; Geck, J, Electronic Confinement and Ordering Instabilities in Colossal Magnetoresistive Bilayer Manganites, Source: *Physical Review Letters* Volume: 108 Issue: 1 Article Number: 016403 DOI: 10.1103/PhysRevLett.108.016403, **2012**.

Behr, G; Loser, W; Wizen, N; Ribeiro, P; **Apostu, MO**; Souptel, D, "Influence of heat distribution and zone shape in the floating zone growth of selected oxide compounds", Source: *Journal of Materials science* Volume: 45 Issue: 8 Special Issue: SI Pages: 2223-2227 DOI: 10.1007/s10853-009-4075-6, **2010**.

Melnig, V., **Apostu, M.-O.**, Foca, N., „Polymer-assisted synthesis of water-soluble PbSe quantum dots”, *Journal Of Nanoparticle Research* 10 (SUPPL. 1), pp. 171-177, **2008**.

Matsukawa, M; Yamato, Y; Kumagai, T; Tamura, A; Suryanarayanan, R; Nimori, S; **Apostu, M**; Revcolevschi, A; Koyama, K; Kobayashi, N, „Steplike lattice deformation of single crystalline $La_{0.4}Pr_{0.6}1.2Sr_{1.8}Mn_2O_7$ bilayered manganite”, *Physical Review Letters* 98 (26): Art No. 267204, **2007**.

Melnig, V; **Apostu, MO**; Tura, V; Ciobanu, C, „Optimization of polyurethane membranes - Morphology and structure studies” *Journal of Membrane Science* 267 (1-2):58-67 Art No. 10.1016, **2005**.

Wang, F; Gukasov, A; Moussa, F; Hennion, M; **Apostu, M**; Suryanarayanan, R; Revcolevschi, A, „Field-induced ferromagnetic metallic state of bilayer manganite $La_{0.4}Pr_{0.6}1.2Sr_{1.8}Mn_2O_7$: A polarized neutron diffraction study”, *Physical Review Letters* 91 (4): Art No. 047204, **2003**.

Apostu, M; Suryanarayanan, R; Revcolevschi, A; Ogasawara, H; Matsukawa, M; Yoshizawa, M; Kobayashi, N, „First-order field-induced transition, magnetoresistance, and giant magnetostriction in single crystals of $La_{0.4}Pr_{0.6}1.2Sr_{1.8}Mn_2O_7$ ”, *Physical Review B* 64 (1): Art No. 012407, **2001**.



(b.1973)

Assoc. Prof., PhD.

e-mail:
amo@uaic.ro

Physical Chemistry

Chemical thermodynamics

Phase transitions

Membrane transport

PhD studies

„Alexandru Ioan Cuza” University from Iași, Romania and Paris-Sud XI University, France – cotutelle - 2002

Research

Scholarship (PhD)

Paris-Sud XI University, France, 1998-2001 (4 stages), BGF

Invited researcher

IFW Institute for Solid State and Materials Research Dresden, Germany

Visiting professor

Paris-Sud XI University, France

Invited conferences

IFW Institute for Solid State and Materials Research Dresden, Germany - Floating zone technique