

Program Nucleu

Contract MEC 10/05.03.03, 2003-2006

Obiectiv 01, Tema (proiect) 03

M Apostol

**Condensati cuantici,
Nanostructuri atomice si moleculare,
Tehnici si strategii GRID**

**Raport de activitate
2003-2005**

Rapoarte interimare 2003-August 2005

- 1 Clusteri atomici si moleculari
- 2* Potentiale efective in nanostructuri
- 3 Tranzitii de faza, ansamble laticiale, I
- 4 Tranzitii de faza, ansamble laticiale, II
- 5 Excitatie polaronice in geometrii restrictionate I
- 6 Excitatie polaronice in geometrii restrictionate II
- 7 Strategie IT pentru aliniere UE
- 8 Testbed GRID, optimizare
- 9* Software dedicat masuratori performante GRID

Personal

12 cercetatori (3 CSG1, 5 CSG2, 1 CSG3, 2 CS)

M Apostol, N Angelescu, E Radescu

M Bundaru, F Buzatu, V Manu, O Carbutaru, S Constantinescu

V Barsan

C Schiaua, L C Cune

Valoare totala: 6.6 miliarde lei (3 ani 2003-2005)

Echipamente: zero lei

Consumabile: 100 milioane lei

Costuri reale 2 miliarde lei

Restul: taxe, impozite, regii

Acoperire: 4 luni pe an

REZULTATE

- A Teorie originala a legaturii chimice
(Descriere cuasiclasica)
Nanostructuri metalice (omogene)**
- B Solubilitatea a 2 lichide in prezenta solventului
(Laticial, Analogie cu modelul Ising, Diagrame de faza,
temperatura, concentratie, interactie; Model solubil exact)**
- C Polaronul (electron-phonon optic;
starea fundamentala pentru impuls marginit in 3D,
orice impuls in 2D)**
- D Armonizarea GRID pe Platforma Magurele,
in vederea compatibilitatii si optimizarii legaturii
cu CERN (soft Globus-CERN, >ssh grid-ui.nipne.ro)**

PERSPECTIVE

- A Clusteri neomogenii (multi-specii)
- B Extinderea la miscibilitatea depunerilor multiple in straturi subtiri**
- C Extinderea la studiul starilor excitate ale polaronului
- D Continuarea catre tehnologia GRID LHC-CERN**

1. Theory of atomic clusters. Metallic clusters deposited on surfaces
L. C. Cune and M. Apostol
in *Low-Dimensional Systems: Theory, Preparation and some Applications*,
eds L. M. Liz-Marzan and M. Giersig, Kluwer (2003), p.1
2. Spinodal curves of phase separation in laticial
molecular liquids with three-particle correlations
F. D. Buzatu, D. A. Huckaby
Phys. A (submitted)
3. Lower spectral branches for a particle coupled to a Bose field
N. Angelescu, R. A. Minlos, V. A. Zagrebnov
Revs. Math. Phys. (submitted)
4. Quasiclassical approach to Bose condensation in a finite potential well
M. Bundaru, L. A. Banyai, H. Haug
Phys. Rev. **B70** 045201 (2004)
5. Bose-Einstein condensation in a 2D-oscillator well
M. Bundaru, L. A. Banyai
(to be submitted)
6. Linear response of the self-consistent Bogoljubov model of Bose-Einstein
condensation
M. Bundaru, L. A. Banyai, P. Gartner
arXiv: cond-mat/0407426 (2004)
7. Bose-Einstein condensation and superfluidity
M. Apostol
Roum. Repts. Phys. **48** Suppl 1 281 (2003)

- 8 Opening talk on the Course of Theoretical Physics, February 6, 2003
M. Apostol
J. Theor. Phys. **84** 21 (2003)
- 9 On linear anharmonic oscillators and self-consistent harmonic approximation
M. Apostol
J. Theor. Phys. **87** 41 (2003)
- 10 Advanced Materials
M. Apostol
J. Theor. Phys. **88** 42 (2003)
- 11 A pulse thermoelectric machine
M. Apostol
J. Theor. Phys. **91** 55 (2003)
- 12 Einstein's Physics (Lecture two of the Course of Theoretical Physics)
M. Apostol
J. Theor. Phys. **92** 68 (2004)
- 13 On parametric excitations of magnetization under electric flows
L. C. Cune and M. Apostol
J. Theor. Phys. **93** 78 (2004)
- 14 On superfluid spectrum of He⁴
L. C. Cune and M. Apostol
J. Theor. Phys. **94** 84 (2004)
- 15 A few Nanocomments on NanoScience and NanoTechnology
M. Apostol
J. Theor. Phys. **96** 98 (2004)
- 16 Science and Computations (Lecture three of the Course of Theoretical Physics)
M. Apostol
J. Theor. Phys. **97** 121 (2005)

- 17 On probabilities (Lecture fourth of the Course of Theoretical Physics)
M Apostol
J. Theor. Phys. **98** 130 (2005)
- 18 Power-law distributions and avalanche phenomena
M Apostol
J. Theor. Phys. **99** 137 (2005)
- 19 On distributions with isolated points and a condensation phenomenon
M. Apostol
J. Theor. Phys. **100** 139 (2005)
- 20 Equivalent circuits for pulse-operating thermoelements
M Apostol and L. C. Cune
J.Theor.Phys. **101** 142 (2004)

Books (© apoma, MB)

- 1 **Field-Controlled Superconducting Transistor**
M. Apostol and L. C. Cune (2003)
- 2 **Studiul interactiunilor in sisteme fermionice – Clusteri metalici**
L. C. Cune, PhD Thesis (2004)
- 3 **The Antiphysical Review**
M. Apostol (2005)
- 4 **Journal of Theoretical Physics (vol 4)**
M. Apostol (2005)

Concluzii si Evaluarea “Programului Nucleu” (PN)

- 1 PN fragmenteaza si atomizeaza cercetarea
- 2 PN isi incalca definitia: short-term vs long-term, basic vs occasional
- 3 PN confunda cercetarea cu productia, stiinta cu activitatile comerciale, rezultatele stiintifice cu publicatiile
- 4 PN birocratizeaza cercetarea
- 5 PN nu finanteaza echipamente de calcul
- 6 PN falsifica cercetarea prin cerinte ISI, prin notiunea de “excelenta”
- 7 PN amesteca cercetatorii romani cu cercetatori nemti, americani, etc
- 8 PN finanteaza (sub-finanteaza) cercetari facute in strainatate
- 9 PN nu are o normare a activitatilor de cercetare per om (“faze” de 300 mil vs “faze” de 1.5 miliarde)
- 10 PN confunda cercetarea cu sportul, prin notiunea de “competitie” (“strategie” de chibitz de fotba)

La Nivelul Tarii PN Finanteaza:

Delta Dunarii !

Demografia !

“Optronica”?

Mediu !

Securitatea in munca?

Poluarea !

Turbina de Gaze?

Ingineria Calitatii ??

Utilaj Petrolier !

Textile !!

Societatea informationala?

Marea Neagra !!

Constructii !!

Micro-Nano-Structuri ai alte Sisteme !

IVB – F !!

Alinierea Electrotehnicii Craiova la UE !

Incerari de Materiale !!

Agricultura si Alimente !

Boli si alte Infectioase !!

BIOSTAR ??

Medicamente Natur !!!

Procese izotopice si moleculare !!

Imbunatatirea Cunoasterii Geologiei Romaniei !

Magnetismul !!

Incluziunea sociala !!

Marea Neagra – Delta Dunarii !!

Comunicatii Accesibile ??

Prioritati ale Dezvoltarii Spatiale ?

Metode Moderne in Materiale ??

Valorificarea metalelor rare ??

Produse chimice ecologice !!

Electromagnetism tehnic si aplicat !!

E GREU !

E o Perioada de “Tranzitie” !

Tranzitia se face

“De la pas de defilare la Excelenta-n Cercetare”

