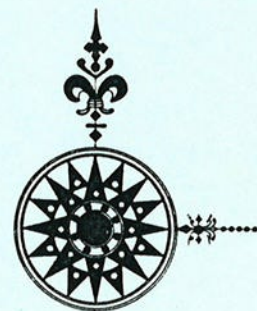


**PROGRAM  
AND  
ABSTRACTS**

G. H. Lander



**21èmes JOURNÉES DES ACTINIDES**

April 28 - May 1, 1991

Montechoro, Algarve - Portugal

**21<sup>èmes</sup> Journées des Actinides**

Organized by

*Noémia Marques and A. Pires de Matos*

Departamento de Química

ICEN - LNETI

2686 Sacavém Codex

Portugal

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The organization of this Meeting was possible due to the work of many staff members of the Department of Chemistry of the ICEN-LNETI.

## CONTENTS

GENERAL INFORMATION	6
PROGRAM	7
ABSTRACTS	
1. THEORY, PHYSICAL AND CHEMICAL PROPERTIES	25
2. SOLID STATE PHYSICS AND CHEMISTRY	93
3. SUPERCONDUCTING MATERIALS	157
4. COORDINATION AND ORGANOMETALLIC COMPOUNDS	163
5. ANALYTICAL AND ENVIRONMENTAL CHEMISTRY	197
AUTHOR INDEX	211
LIST OF PARTICIPANTS	219

## GENERAL INFORMATION

**Oral Communications:** All the participants will have 15 minutes to present their communications.

**Posters:** The posters should be on display from Monday 29 until the end of the Poster Session, Tuesday 30 at 18.30.

**Reminder:** The conference fee does not include any hotel extras; beverages taken during the meals will be extras.

**PROGRAM**

SUNDAY, APRIL 28	MONDAY, APRIL 29	TUESDAY, APRIL 30	WEDNESDAY, MAY 1
<p>16.00-19.30 Registration</p> <p>20.00 Dinner</p>	<p>8.00-9.00 Registration</p> <p>9.00-9.15 Welcome Address</p> <p>9.15-10.50 I Phys. Chem. Properties</p> <p>10.50-11.20 Coffee Break</p> <p>11.20-12.55 II Phys. Chem. Properties</p> <p>13.00-15.00 Lunch</p> <p>15.00-16.55 III Chemistry</p> <p>16.55-17.20 Coffee Break</p> <p>17.20-18.55 IV Phys. Chem. Properties</p> <p>20.00 Dinner</p>	<p>9.00-10.35 V Phys. Chem. Properties</p> <p>10.35-11.00 Coffee Break</p> <p>11.00-12.55 VI Solid State Phys. Chem.</p> <p>13.00-15.00 Lunch</p> <p>15.00-15.55 VII Solid State Phys. Chem.</p> <p>15.55-16.20 Coffee Break</p> <p>16.20-18.30 VIII Posters</p> <p>19.00 Conference Dinner</p>	<p>9.00-10.15 IX Solid State Phys. Chem.</p> <p>10.15-10.40 Coffee Break</p> <p>10.40-11.30 Conf. Summary Perspectives</p> <p>13.00 Lunch Farewell</p>

**SUNDAY, APRIL 28**

16.00 - 19.30 **REGISTRATION**

20.00 **DINNER**

**MONDAY, APRIL 29**

8.00 - 9.00 **REGISTRATION**

9.00 - 9.15 **WELCOME ADDRESS**

9.15 - 10.50 **SESSION I: THEORY, PHYSICAL AND CHEMICAL PROPERTIES**

Chairperson: *P. Wachter*

**O1.1 Predicting Moment «Wash-out» and the Approach to Heavy Fermion Behavior in Cerium and Light Actinide Systems**

*B.R. Cooper, Q.G. Sheng, S.P. Lim, C. Sanchez-Castro, N. Kioussis and J.M. Wills*

**O1.2 New MTO Band Calculations of Equilibrium Properties of Actinide Metals**

*M. Pénicaud*

**O1.3 Crystal-Field Calculations including both J-Mixing and Intermultiplet Interactions**

*G.L. Goodman*

**O1.4 5f Electron Localization in UTX Compounds**

*L. Havela and V. Sechovsky*

**O1.5 Structure and Magnetic Properties of  $U(Fe_xCu_{1-x})_4Al_8$  System**

*W. Suski, A. Baran, L. Folcik, K. Wochowski and T. Mydlarz*

10.50 - 11.20 **COFFEE BREAK**

11.20 - 12.55 SESSION II: THEORY, PHYSICAL AND CHEMICAL PROPERTIES

Chairperson: *R. Troc*

**O1.6 Magnetization Measurements on Single Crystals of NpAs-NpSe Mixed Compounds**

*K. Mattenberger, O. Vogt, J. Rebizant, J.C. Spirlet, F. Bourdarot, P. Burret and J. Rossat-Mignod*

**O1.7  $\mu$ SR on Simple Cubic Actinide Compounds; Next Episode: UN**

*K.H. Münch, A. Kratzer, G.M. Kalvius and L. Asch*

**O1.8 Magnetization Density of U in UCoAl and UCu<sub>2</sub>P<sub>2</sub> Compounds**

*A. Delapalme, J.M. Fournier, B. Gillon, L. Havela, V. Sechovsky, M. Wulff, D. Kaczorowski, R. Troc and Z. Zolnierak*

**O1.9 The Pu Chalcogenides and Intermediate Valence: the Determination of some Elastic Constants by Brillouin Scattering**

*M. Mendik, P. Wachter, J.C. Spirlet and J. Rebizant*

**O1.10 Low Temperature Heat Capacity of NpSb**

*R.O.A. Hall, M.J. Mortimer and J.C. Spirlet*

13.00 - 15.00 LUNCH

15.00 - 16.55 SESSION III: CHEMISTRY

Chairperson: *J. Goffart*

**O4.1 Synthesis, Spectroscopy and Crystal Structure of a New Stable Biscyclopentadienyl Uranium(IV) Dichloride containing Two C<sub>5</sub>H<sub>4</sub>-Rings Interlinked by a Metal-Coordinated 2,6-Bis(methylene)-pyridyl Unit**

*G. Paolucci, R.D. Fischer, F. Benetollo, R. Seraglia and G. Bombieri*

**O4.2 Some Aspects of Neptunium(V) Crystal Chemistry in Comparison with Uranyl**

*M.S. Grigoriev*

**O4.3 Electron Absorption Spectra and Structure of Neptunium(V) Solid Compounds**

*N.N. Krot, A.A. Bessonov and M.S. Grigoriev*

**O5.1 Coordination Chemistry for New Actinide Separation Processes**

*C. Musikas*

**O5.2 Extraction of Actinides by Amide Organic Media: an Approach of Non-Ideality Effects through a Simplified Statistical Mechanic Theory**

*N. Condamines, C. Musikas and P. Turq*

**O5.3 Solubility and Hydrolysis Behaviour of Neptunium(V)**

*V. Neck, J.I. Kim and B. Kanellakopoulos*

16.55 - 17.20 **COFFEE BREAK**

17.20 - 18.55 **SESSION IV: THEORY, PHYSICAL AND CHEMICAL PROPERTIES**

Chairperson: *J.M. Fournier*

**O1.11 Magnetic and Transport Properties of the UTSn Series (T= Co, Ni, Ru, Rh, Pd, Ir and Pt)**

*R. Troc and V.H. Tran*

**O1.12 Magnetic Properties of NpGa<sub>2</sub>**

*I. Yaar, J. Gal, W. Potzel, G.M. Kalvius, G. Will and W. Schäfer*

**O1.13 Magnetic Properties of NpBi from Mössbauer and Neutron Diffraction Measurements**

*J.P. Sanchez, A. Blaise, M.N. Bouillet, F. Bourdarot, P. Burlet, J. Rossat-Mignod, J. Rebizant, J.C. Spirlet and O. Vogt*

**O1.14 Systematics of Mössbauer Hyperfine Parameters in Np Intermetallics**  
*G.M. Kalvius, J. Gal, L. Asch and W. Potzel*

**O1.15 Far Infrared Optical Study of  $U(Pt_{0.9},Pd_{0.1})_3$  and the Effect of Coherence on the Heavy Fermion Properties of  $UPt_3$**   
*F. Marabelli, P. Wachter and J.J.M. Franse*

20.00        **DINNER**

**TUESDAY, APRIL 30**

9.00 - 10.35    **SESSION V: THEORY, PHYSICAL AND CHEMICAL PROPERTIES**

Chairperson: *G.H. Lander*

**O1.16 New Points of View on the Symmetric Fission of the Heavy Actinides**  
*G. Mouze and C. Ythier*

**O1.17 ENDOR d'un Composé Organométallique de l'Uranium Trivalent**  
*E. Soulié, J.F. LeMaréchal and D. Gourier*

**O1.18 The Large Range of Uranyl Bond Lengths: *ab initio* Calculations on Simple Uranium-Oxygen Clusters**  
*P. Pyykkö and Y. Zhao*

**O1.19 Adsorption Studies of UNiAl using Photoemission Spectroscopy**  
*T. Almeida, L. Havela, J.C. Spirlet and J.R. Naegele*

**O3.1 Anisotropy of Superconducting Critical Fields near  $T_c$  and Thermal Transport in Normal State in  $URu_2Si_2$  and  $UBe_{13}$  Single Crystals**  
*F.G. Aliev, V. Kovacik, V.V. Moshchalkov, V.V. Pryadun, T.T.M. Palstra, A.V. Mitin and M.A. Arranz Monge*

10.35 - 11.00    **COFFEE BREAK**

11.00 - 12.55 **SESSION VI: SOLID STATE PHYSICS AND CHEMISTRY**

Chairperson: *J. Schoenes*

**O2.1 Preparation and Characterization of Actinide Containing Materials**

*J.C. Spirlet, J. Rebizant, F. Wastin, Y. Kergadallan, E. Bednarczyk, J. Kalbusch, A. Moens and C. Rijkeboer*

**O2.2 On the Formation of Nitrogen-rich  $U_2N_3$  by the Reaction of Uranium with Flowing Ammonia**

*M. Katsura and M. Miyake*

**O2.3 Crystal Structure of the Uranium Monosilicide USi**

*T. Le Bihan, H. Noël, K. Remschnig and P. Rogl*

**O2.4 Systematics across the NpTX and PuTX Series (T= VII<sup>th</sup> Group; X= Al, Ga, Si)**

*Y. Kergadallan, A. Moens, J. Rebizant, C. Rijkeboer, J.C. Spirlet and F. Wastin*

**O2.5 High-Pressure Phases and Compressibility of NpSe, UBi and CmBi**

*M. Gensini, R.G. Haire, U. Benedict, F. Hulliger and J. Rebizant*

**O2.6 Resonant Magnetic X-Ray Scattering in a Series of Uranium Compounds**

*C.C. Tang, W.G. Stirling, G.H. Lander, D. Gibbs, W. Herzog, P. Carra, K. Mattenberger and O. Vogt*

13.00 - 15.00 **LUNCH**

15.00 - 15.55 SESSION VII: SOLID STATE PHYSICS AND CHEMISTRY

Chairperson: *J. C. Spirlet*

**O2.7 Magnetic Properties of NpS and NpSe: Mössbauer Spectroscopy and Single Crystal Neutron Diffraction**  
*P. Burlet, A. Blaise, M.N. Bouillet, F. Bourdarot, J. Rossat-Mignod, J.P. Sanchez, J.C. Spirlet, J. Rebizant and O. Vogt*

**O2.8 Magnetic Phase Diagram of the  $U(Rh_{1-x}Ru_x)_2Si_2$  System**  
*P. Burlet, F. Bourdarot, S. Quezel, J. Rossat-Mignod, P. Lejay and P. Chevalier*

**O2.9 Study on Magnetic Properties of  $(U_{1-y}Ce_y)O_2$  by Neutron Diffraction**  
*M. Beauvy and G. Andre*

15.55 - 16.20 COFFEE BREAK

16.20 - 18.30 SESSION VIII: POSTERS

**P1.1  $5f^16d^1$  Configuration of  $U^{4+}$  in  $ThBr_4$**   
*R.C. Naik and J.C. Krupa*

**P1.2 The New Limits for the Ratios of the f Electron Slater and Racah Parameters**  
*V. Vokhmin and G. Ionova*

**P1.3 Crystal Field Splittings, Jahn-Teller Effect and Magnetic Susceptibility of  $(NEt_4)_4U(NCS)_8$**   
*V.S. Mironov and S.P. Rozov*

**P1.4 Crystal Field Spectrum of  $(NEt_4)_4Pa(NCS)_8$**   
*S.P. Rozov and V.S. Mironov*

**P1.5 Hybridization in UTX: a Simple Approach**  
*E. Brück, P.F. de Châtel, L. Havela and V. Sechovsky*

- P1.6 Photoemission Study of 5f Electron Localization in UTX Compounds**  
*L. Havela, J.R. Naegele, T. Almeida, V. Sechovsky and E. Brück*
- P1.7 Specific Heat of UNiAl in High Magnetic Fields**  
*E. Brück, H.P. van der Meulen, A.A. Menovsky, F.R. de Boer, P.F. de Châtel, J.J.M. Franse, J.A.A.J. Perenboom, T.T.J.M. Berendschot, H. van Kempen, L. Havela and V. Sechovsky*
- P1.8 Metamagnetic Transitions in UTX Compounds Analyzed in terms of the Spin-Hamiltonian Model**  
*M. Diviš, V. Sechovsky and L. Havela*
- P1.9 Magnetic and Magnetotransport Properties of UNiGa**  
*L. Jirman, V. Sechovsky, L. Havela, W. Je, T. Takabatake, H. Fujii, T. Suzuki, E. Brück and F.R. de Boer*
- P1.10 Recent Studies of the Magnetic Ordering in Several Solid Solutions  $U(M,M')_2X_2$  ( $M, M' = Co, Ni, Cu; X = Si, Ge$ )**  
*M. Kuznietz, H. Pinto, H. Etedgui and M. Melamud*
- P1.11 Magnetism of Uranium-Nickel-Borides**  
*K. Hiebl, P. Rogl, C. Horvath and H. Noël*
- P1.12 High Temperature Equilibria in the U-Ti-O Ternary System**  
*M. Miyake, J. Shimizu and S. Yamanaka*
- P2.1 Heavy-Fermions in Ternary U-Cu-Al Compounds**  
*C. Geibel, S. Thies, D. Kaczorowski, C. Schank, A. Mehner, B. Seidel and F. Steglich*
- P2.2  $\delta$ Plutonium: a Kondo Lattice?**  
*J.M. Fournier, S. Meot-Reymond, F. Couvreur and D. Damien*
- P2.3 Antiferromagnetic Ordering in UNiAl**  
*J.M. Fournier and P. Burlet*

- P2.4** Magnetic and Electrical Properties of  $UT_2Sn_2$  (T = Co, Ni, Cu) Inter-metallics  
*D. Kaczorowski, Z. Zolnierak, R. Köhler, C. Geibel and F. Steglich*
- P2.5** High-Field Magnetization of  $UAl_{12-x}Fe_x$  Intermetallic Compounds  
*A. V. Andreev, H. Nakotte and F.R. de Boer*
- P2.6** Magnetization Density in URhAl - Evidence for Hybridization Effects  
*J.A. Paixão, G.H. Lander, P.J. Brown, H. Nakotte and F.R. de Boer*
- P2.7** Thermal Expansion and Spontaneous Magnetostriction of a  $UCo_{5.3}$  Single Crystal  
*A. V. Andreev*
- P2.8** Single Crystal Neutron Diffraction Study of  $UNi_{1-6}As_2$   
*P. Burlet, J. Rossat-Mignod, R. Troc, D. Kaczorowski and H. Noël*
- P2.9** High-Pressure Optical Studies on Uranium and Thorium Compounds  
*M. Gensini, K. Syassen, U. Benedict, F. Hulliger and O. Vogt*
- P2.10** High-Pressure X-Ray Diffraction Studies on Actinide Pnictides and Chalcogenides  
*M. Gensini, R.G. Haire, U. Benedict, F. Hulliger, O. Vogt and J.C. Spirlet*
- P2.11**  $NpSn_3$  and  $NpIn_3$ : Synthesis and Physical Properties  
*T. Charvolin, J. Larroque, P. Burlet, J.M. Fournier and J.P. Sanchez*
- P2.12** Solid State Interaction of Neptunium(V) Compounds with Various Reagents in Basic Media  
*I.G. Tananaev*
- P2.13** Magnetic Properties of Pentavalent Uranium Ternary Oxides with Fluorite Structure (II)  
*C. Miyake, O. Kawasaki and K. Gotoh*

**P2.14 Magnetic Properties of Novel UFe/Si,Ge/ and UAu/Si,Ge/ Phases**

*V.H. Tran and R. Troc*

**P3.1 Curium (Cm) as a Rare Earth Substitute in Superconductor-Related Oxides**

*L. Soderholm, G.L. Goodman, C.W. Williams, C.-K. Loong and U. Welp*

**P4.1 Synthesis and Thermochemistry of New Indenyl Compounds of Actinides and Lanthanides**

*J. Goffart and X. Jemine*

**P4.2 NMR Study of the Energetics of a Uranium-Tetrahydrofuran Bond in a U(IV) Polypyrazolylborate Complex**

*J.P. Leal, N. Marques, A. Pires de Matos and J.A. Martinho Simões*

**P4.3 The Reactivity of the Carbyl  $\text{UCl}_2[\text{CH}(\text{SiMe}_3)_2][\text{HB}(3,5\text{-Me}_2\text{Pz})_3]$  towards Alcohols and Ketones**

*N. Marques and M. Silva*

**P4.4 Synthesis and Structural Characterization of the Alkylthiolate Complex  $\text{U}(\text{S}^i\text{Pr})_2(\text{HBPz}_3)_2$**

*A. Domingos, A. Pires de Matos and I. Santos*

**P4.5 Mixed Polypyrazolyl-Cyclopentadienyl Thorium(IV) Complexes. Hydrocarbyl, Thiolate, Alkoxide and Aryloxy Derivatives of  $\text{Th}[\text{HB}(3,5\text{-Me}_2\text{Pz})_3]\text{CpCl}_2$  and the Crystal and Molecular Structure of the Oxo-Bridged Dimer  $\{\text{Th}[\text{HB}(3,5\text{-Me}_2\text{Pz})_3]\text{CpCl}\}_2(\mu\text{-O})$**

*A. Domingos, J. Marçalo and A. Pires de Matos*

**P4.6 Crystal Structures of Two Oxo-Bridged 3,5-Dimethylpyrazolylborate Uranium(IV) Complexes,  $\{\text{U}[\text{HB}(3,5\text{-Me}_2\text{Pz})_3]\text{Cl}(\mu\text{-O})\}_4$  and  $\{\text{U}[\text{HB}(3,5\text{-Me}_2\text{Pz})_3]\text{Cl}_2\}_2(\mu\text{-O})$**

*A. Domingos, N. Marques, I. Santos and M. Silva*

- P4.7** Dihydrobis(3,5-dimethylpyrazolyl)borate Uranium(III,IV) and Uranyl Complexes. Crystal and Molecular Structure of  $U[H_2B(3,5-Me_2Pz)_2]_3$   
*A. Carvalho, A. Domingos, N. Marques, A. Pires de Matos and I. Santos*
- P4.8** Novel 3,5-Dimethylpyrazolato Complexes of the Trivalent Actinoids and Lanthanoids  $\{Cl_2M^{III}[HB(Me_2C_3N_2H_2)_3]-(Me_2C_3N_2H_2)\}_2$ , ( $M^{III} = Pu, Pr, Nd, Yb$ )  
*C. Apostolidis, B. Kanellakopulos, R. Maier, D. Meyer, N. Marques and J. Rebizant*
- P4.9** Direct Evidence of Uranium(V) Intermediates by Electron Spin Resonance in Photo- and Electrolytic Reduction Processes of Uranyl Complexes in Organic Solutions (III)  
*C. Miyake, T. Nakase and Z. Yoshida*
- P4.10** Catalytic Reduction of Uranium by Hydrazine in Nitric Acid Solutions in the Presence of Fluoride Ions  
*H.M. Abdunnabi, A.V. Ananyev and N.N. Krot*
- P5.1** On the Use of Time-Resolved Laser-Induced Fluorescence for Actinide Analysis  
*P. Decambox, P. Mauchien and C. Moulin*
- P5.2**  $\alpha$ -Spectrometric Determination of Pu followed by Thin Film Extraction  
*M.A. Abuzwida, A.G. Maslennikov and V.F. Peretrukhin*

19.00

CONFERENCE DINNER

**WEDNESDAY, MAY 1**

**9.00 - 10.15 SESSION IX: SOLID STATE PHYSICS AND CHEMISTRY**

Chairperson: *M. Beauvy*

**O2.10 Magnetic Structure of  $U_4Cu_4P_7$  Single Crystal**

*P. Burlet, J. Rossat-Mignod, M. Bonnet, H. Noël, D. Kaczorowski and R. Troc*

**O2.11 Magnetic and Electrical Properties of some Neptunium Intermetallics  $NpT_2Si_2$  (T= Rh, Pd, Ir)**

*A. Blaise, P. Burlet, J.M. Fournier, J. Rebizant, J. Rossat-Mignod, J.P. Sanchez, J.C. Spirlet and F. Wastin*

**O2.12 Electrical Resistivity of Neptunium Monochalcogenides**

*J.M. Fournier, E. Pleska, J. Chiapusio, J. Rebizant, J.C. Spirlet and O. Vogt*

**O2.13 Magneto-Transport Study of  $UNiAl$  Single Crystals**

*J. Schoenes, F. Troisi, E. Brück and A.A. Menovsky*

**10.15 - 10.40 COFFEE BREAK**

**10.40 - 11.30 CONFERENCE SUMMARY AND PERSPECTIVES**

Chairpersons: *B.R. Cooper and G.M. Kalvius*

**13.00 LUNCH AND FAREWELL**