



# 29<sup>èmes</sup> Journées des Actinides



## Programme and Abstracts

Luso, Portugal

15-17 April 1999

29<sup>èmes</sup> Journées des Actinides, 14-17 May 1999, Luso, Portugal



## 29<sup>èmes</sup> Journées des Actinides

### Organizing Committee

Manuel Almeida, Chairman (ITN, Sacavém)  
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João Carlos Waerenborgh (ITN, Sacavém)

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Caixa Geral de Depósitos  
Câmara Municipal da Mealhada  
Junta de Turismo do Luso Buçaco  
Oxford Instruments  
Toshiba

is gratefully acknowledged.

Edited by J. C. Wa

Coliveau

Dear Colleague:

## Welcome at Luso!

On behalf of the Organizing Committee I would like to welcome all the participants of the 29<sup>èmes</sup> Journées des Actinides, who will present in Luso their latest achievements sharing with the actinide community the discussion of new results in this field.

These Journées des Actinides are the 29<sup>th</sup> of a series of annual conferences intended to provide a forum for open and informal discussions of all aspects, fundamental and applied, related to the chemistry and physics of the actinides.

The following topics are included:

- **Coordination and organometallic chemistry.**
- **Environmental and solution chemistry.**
- **Solid state chemistry and physics.**
- **Preparation and structural characterisation of metals, alloys, compounds and solid solutions.**
- **Electronic and magnetic properties.**
- **Theory of chemical and physical effects.**

The scientific programme is expected to give a survey of recent activities and provide new trends for the research in these fields.

To stimulate an atmosphere of intense but relaxed exchange of ideas, ample time is reserved for informal discussions and to stimulate future developments and cooperations. Posters will be on permanent display during all the conference with formal discussion periods during two days.

We hope that you will have an enjoyable time in Luso and a fruitful scientific programme.

*Manuel Almeida*

## GENERAL INFORMATION

In this booklet you will find the programme, time schedule and abstracts of the communications.

All the scientific events will take place at the *Grande Hotel de Luso*, where all the participants are lodged. Lectures will be presented at the auditorium *Bissaya Barreto* at the ground level (1) where facilities are available both for slides and transparencies. Lecturers should load their slides and check them, in the nearby organization room near the conference desk, prior to the session in which the presentation will take place.

Posters will be on display during the entire period of the conference from Thursday 15 April in the morning, when they should be posted, until the evening of Saturday 17 April, when they should be removed. The poster order and exact location is indicated at the entrance of the auditorium. Two specific poster discussion sessions are arranged for 15 April after dinner and 16 April during the afternoon, although we encourage discussion at any time during the Journées. For any further questions concerning the scientific programme please contact the organisers or the conference desk.

Registration fee includes hotel room, and full board starting with dinner in Wednesday, 14 April and ending with breakfast in Sunday, 18 April. Meals are served at the restaurant of the Hotel as follows:

- Breakfast starting from 7h45.
- Coffee or tea during breaks between sessions at the auditorium foyer
- Lunch, as a buffet, starting immediately after the morning sessions.
- Dinner starting immediately after the afternoon sessions at 19h45.

Coffee, wine and mineral water are included in the main meals. Tickets allowing free beer or soda drinking during the poster sessions are also included in your registration package. Extra drinks or any further expenses as telephone calls should be paid directly to the hotel.

The conference dinner, an informal affair, will take place at *Palácio S. Marcos*, nearby Coimbra, on Friday 16. Transportation by bus will leave the Hotel at 19:30

The *Grande Hotel de Luso* has several recreation facilities, including a covered and an open air swimming pool, sauna, steam bath, tennis and squash courts and children's play areas. Just in front of the hotel there is a park with a maintenance circuit.

Nearby Luso there are some interesting places worth to be visited. A choice of activities for accompanying persons is suggested.

Please contact the front desk of the Hotel for any question regarding the meals, hotel service and accommodation. If you need any further information during the meeting please do not hesitate in contacting us. We wear coloured badges!

We wish you a very pleasant stay and a successful meeting.

*The Organizing Committee*

# 29<sup>th</sup> Journées des Actinides

## Programme

Wednesday, 14 April, 1999

17:45-20:00 Registration

20:00 Dinner

Thursday, 15 April, 1999

9:00 Welcome Address

**Chairman P. Burlet**

9:15 S. Coad, L. Paolasini, P. Dervenagas, D. Mannix, **G. H. Lander**, N. Bernhoeft, A. Hiess, P. J. Brown, P. Burlet, F. Bourdarot, J. Rebizant, D. Kaczorowski, a. Czopnik and R. Troc, *Neutron and X-ray studies of  $UGa_3$  single crystals.*

9:40 **S. L. Dudarev**, M. R. Castell, A. P. Sutton and A. Briggs, *Electron tunneling imaging of uranium oxides: How one can see the f-states?*

10:05 **D. Mannix**, R. Caciuffo, N. Bernhoeft, G. H. Lander, J. Rebizant, E. Lindström and C. Vettier, *Light on the mysterious magnetism of  $NpO_2$ .*

10:30 A. L. Cornelius, A. J. Arko, J. L. Sarrao, J. D. Thompson, M. F. Hundley, C. H. Booth N. Harrison and **P. Oppeneer**, *Electronic properties of  $UX_3$  ( $X=Al, Ga, Sn$ ) compounds in high magnetic fields.*

10:55 Coffee Break

**Chairman G. H. Lander**

11:25 **R. Troć**, V. Zaremba, and M. Kuznietz, *Pseudobinary  $U(T,In)_5$  solid solutions and ternary  $UT_4In$  compounds ( $T=$  transition element) crystallographic, magnetic, and electrical properties.*

11:50 M. Kuznietz, A. P. Gonçalves, J. C. Waeremborgh, M. Almeida, **C. Cardoso**, M. M. Cruz and M. Godinho, *Magnetic phase diagram of the semi-ordered alloys  $UFe_xAl_{12-x}$ .*

12:15 **L. M. Sandratskii** and J. Kubler, *Interaction of the magnetic sublattices in  $UFe_4Al_8$ .*

12:40 **S. Sérgio**, A. P. Gonçalves, J. C. Waeremborgh, J. A. Paixão M. Almeida and M. Godinho, *Study of the new compounds  $UFe_4Al_{8-x}Ga_x$  ( $0 < x < 2$ ).*

13:05 Lunch

17:00 Tea Break

Chairman **G. Choppin**

17:20 **D. Leroy**, L. Martinot, C. Jérôme and R. Jérôme, *New insoluble polymer composite for the complexation of uranyl ions: polypyrrole doped by complexing polyanions.*

17:45 **I. Bonhoure**, C. D. Auwer, C. Cartier dit Moulin, M.T. Presson and C. Madic, *Molecular and electronic structure of mixed actinide/transition metal hexacyano compounds.*

18:10 **U. Wenzel**, W. Ullrich and D. Freystadt, *On-line monitoring of actinide solutions.*

18:35 **M. S. Eisen**, *Selective catalytic carbon-carbon carbon-heteroatom bond formations promoted by novel organoactinides.*

19:00 **J. P. Leal**, N. Marques and J. Takatz, *Bond dissociation enthalpies in U(IV) complexes. An integrated view.*

19:30 Dinner

21:00 Poster Session I

Friday, 16 April, 1999

Chairman **M. Brooks**

8:50 **B. Cooper**, *Random 5-f localization and the FCC transition and depression of melting temperature in plutonium.*

9:15 **M. Boivineau**, *Thermophysical properties of solid and liquid Pu.*

9:40 **T. Gouder** and F. Wastin, *Photoelectron spectroscopy on thin films of Pu: Temperature dependence.*

10:05 **N. Baclet**, M. Dorneval,  *$\delta$ -Phase Stability in PuCe and PuCeGa Alloys.*

10:30 **J. Marmeggi**, R. Currat, A. Bouvet and G. H. Lander, *The transition into the CDW state in alpha-uranium.*

10:55 Coffee Break

Chairman **A. P. Matos**

11:25 **G. Choppin** and A. Morgenstern, *Kinetics of the reduction of  $\text{Pu(V)O}_2^+$*

11:50 **L. R. Avens**, P.G. Eller and W. L. Miller, *A Vision for environmentally consci*

12:15 **I. May** and R. J. Taylor, *Advances in tetravalent actinide chemistry in the Purex process.*

12:40 **W. J. Evans**, G. W. Nyce and J. W. Ziller, *Synthesis, structure and reactivity of the sterically crowded uranium complex  $(C_5Me_5)_3U$  and related compounds.*

13:05 *Lunch*

15:30-17:00 *Poster Session II*

17:00 *Tea Break*

**Chairman R. Troc**

17:20 **E. Colineau**, F. Wastin and J. Rebizant, *Mössbauer investigations in  $Np_2T_3X_4$  compounds*

17:45 **A. Martin-Martin**, L. C. J. Pereira, G. H. Lander, J. Rebizant and P. J. Brown, *Neutron Scattering Investigation of Single Crystal  $U_2Pt_2In$ .*

18:10 **A. V. Andreev**, V. Sechovsky, N. V. Mushnikov, T. Goto, H. Yamada, and Y. Shiokawa, *5-f itinerant metamagnet  $UCoAl$  under pressure.*

18:35 **M. Kuznietz**, A. P. Gonçalves, L. C. J. Pereira and M. Almeida, *Depression of the superconducting and antiferromagnetic states in the Dy rich  $(U_{1-x}Dy_x)Ni_2B_2C$  solid solutions.*

19:30 *Conference Dinner*

**Saturday, 17 April, 1999.**

**Chairman W. Suski.**

8:50 **P. Wachter** and J. Rebizant, *The Puzzle of the  $AmTe$ .*

9:15 **D. Kolberg**, F. Wastin, J. Rebizant and J. Schoenes, *Magnetic properties of  $Pu_xU_{1-x}Sb$  single crystals.*

9:40 ~~**R. Ahuja**, B. Johansson, M. S. S. Brooks and O. Eriksson, *Electronic and Choesive Properties of  $PuTe$ .*~~

10:05 **A. Bombardi**, B. Grenier, P. Burlet, G. H. Lander, L. P. Regnault, K. Mattenberger and O. Vogt, *Observation of ferromagnetic correlation in diluted  $UTe$ .*

10:30 **O. Vogt**, K. Mattenberger and J. Löhle, *Dependence of the high temperature magnetic susceptibility on the electronic environment in U chalcogenides and pnictides.*

10:55 *Coffee Break*

**Chairman O. Vogt.**

11:25 T. Gouder, L. Havela and F. Wastin, PuSe: Photoelectron spectroscopy on thin layers.

11:50 M. Brooks, Calculated properties of U-N-C system.

12:15 M. Richter, H. Rosner, L. Duò, P. Vavassori, W. Schneider, S. Molodtsov and C. Laubschat, A handy approximation for the self energy of semilocalised holes in filled-d-band metals

12:40 E. Caspi, H. Pinto, H. Shaked and M. Melamud, Isotropic-1D-RKKY description of the magnetic phase diagrams of  $U(M,M')_2Si_2$  solid solutions.

13:05 Lunch

17:00 Tea Break

**Chairman P. Wachter.**

17:20 M. Beauvy, D. Bonifay, Y. Croixmarie, J. M. Bonnerot, R. Mazoyer and A. Poletti. Crystallochemistry and ionicity of actinides mixed oxides,  $(An_yM_{1-y})O_{2+x}$ , with  $An=Th, U, Np, Pu$  or  $Am$ ;  $M=U, Ce, Zr$  or  $Ln$ .

~~17:45 A. M. Fedoseev, J.-C. Krupa, N. A. Budantseva, M. S. Grigoriev and K. E. Guerman, Synthesis, properties and crystal structure of neptunium(VI) dipertechnetate sesquihydrate  $(NpO_2)_2(TcO_4)_4 \cdot 3H_2O$ .~~

18:10 P. Rogl, B. Chevallier, J. Etourneau, H. Michor, G. Hilscher and E. Bauer, Magnetism of  $U_3Pd_{20}Si_6$  (ordered  $Cr_{23}C_6$ -type).

18:35 J. A. Paixão, L. J. Pereira, P. Estrela, L. Paolasini, G. H. Lander, R. A. Robinson, P. J. Brown, M. Godinho, M. Almeida, M. Bonnet, J. Rebizant and J. C. Spirlet, Polarized neutron scattering study of the magnetisation distribution in  $U_2Co_2Sn$  and UPdSn.

19:00 Concluding remarks

19:30 Dinner

**Sunday, 18 April, 1999.**

Departure to Coimbra.

## Posters

- P1 F. Bourdarot, **A. Bombardi**, P. Burlet, R. Calemczuk, G. H. Lander, F. Lapierre, J. P. Sanchez, K. Mattenberger and O. Vogt, *Magnetic ordering and structural anomalies in the  $U_xLa_{1-x}S$  system.*
- P2 **E. Colineau**, F. Wastin and J. Rebizant, *Electronic and magnetic properties of  $NpPd_2Ge_2$ .*
- P3 A. V. Kolomiets, **L. Havela**, D. Rafaja, H. N. Bordallo, H. Nakotte, H. Drulis, W. Iwasieczko and V. A. Yartys, *Magnetic and structure properties of UNiAl hydrides.*
- P4 **A. V. Andreev**, M. Tomida, Y. Homma, Y. Shiokawa, V. Sechovsky, N. V. Mushnikov and T. Goto, *Influence of 5d-metal substitution on magnetic properties of UNiAl.*
- P5 **A. V. Andreev**, Y. Shiokawa, M. Tomida, Y. Homma, V. Sechovsky, N. V. Mushnikov and T. Goto, *Magnetic properties of a UPtAl single crystal.*
- P6 **A. V. Andreev**, N. V. Mushnikov, T. Goto and V. Sechovsky, *Effect of pressure on magnetic properties of  $UCoAl_{1-x}Ga_x$  system.*
- P7 S. Demuyck, L. Sandratskii, S. Cottenier, J. C. Spirlet, J. Meersschaut, W. Truyen and **M. Rots**, *Spin moment ordering in  $UPb_3$  investigated by perturbed angular correlation spectroscopy and theoretical calculations.*
- P8 **M. Kucera**, P. Beránková and D. Chvostová, *Characterization of  $UFe_2$  by optical spectroscopic methods.*
- P9 **S. Coad**, A. Hiess., D. McMorro, G. H. Lander, G. Aeppli, Z. Fisk., G. Stewart, *Magnetic response in  $UBe_{13}$*
- P10 XIA Shangda and **J. C. Krupa**, *Calculated variation trends across the  $AnO_2$  series: Electronic structure and charge transfer transitions.*
- P11 **D. Labroche**, I. Hugon, C. Chatillon, M. C. Cheynet and O. Dugne, *Characterization of the U-Fe-O phases.*
- P12 S. Heathman, **T. Le Bihan**, R. G. Haire, A. Lindbaum, K. Litfin and Y. Meresse, *High pressure X-Ray diffraction studies of pure americium metal up to 100 Gpa.*
- P13 **M. Pénicaud**, *Electronic structure of  $\delta$ -Pu.*
- P14 **K. Litfin**, S. Heathman, K. Mattenberger and J. Schoenes, *Optical properties and X-ray diffraction of US, USe and UTe up to 40 Gpa.*
- P15 M. Aizenshtein, U. Atzmony, D. Hamawi, A. Venkart, **M. P. Dariel** *The morphology of precipitates in dilute U-Fe Alloys.*
- P16 **I. Halevy**, E. Sterer, M. Aizenshtein, G. Kimmel, E. Yahel, D. Regev, U. Atzmony, *Synthesis and characterization of a new ternary uranium compound:  $UV_2Al_{20}$ .*

- P17 **G. Amoretti**, R. Caciuffo, P. Santini, G. H. Lander, J. Kulda and P. de V. Du Plessis, *UO<sub>2</sub> ten years after: A polarized neutron scattering experiment on single-crystal.*
- P18 **W. Suski**, K. Wochowski, A. Gilewski and T. Mydlarz, *Magnetization in high magnetic field and electrical properties of UFe<sub>x</sub>Al<sub>12-x</sub>.*
- P19 **R. Troc**, V. H. Tran, V. Zaremba and J. Stepien-Damm, *Effect of Zr substitution on the physical properties of the (U<sub>1-x</sub>Zr<sub>x</sub>)NiAl system.*
- P20 V. H. Tran, **R. Troc**, V. Zaremba, A. Czopnik, A.M. Strydom and P. de V. Du Plessis, *Magnetic properties of the U<sub>1-x</sub>Th<sub>x</sub>Pt system.*
- P21 **L. C. J. Pereira**, I. Catarino, G. Bonfait, M. Godinho and M. Almeida, *Th substitution in the heavy fermion U<sub>2</sub>Pt<sub>2</sub>In compound.*
- P22 **A. P. Gonçalves**, L. C. J. Pereira., M. Kuznietz and M. Almeida, *Preparation and magnetic properties of UAl<sub>3</sub>C<sub>3</sub>.*
- P23 **T. Fugino**, D. Hara, N. Sato, K. Yamada and A. A Zubkov, *High temperature calorimetry of uranium mixed sulfides.*
- P24 **J. Aupiais**, N. Dacheux, A. C. Thomas and S. Matton, *Study of Np measurement by  $\alpha$ -liquid scintillation.*
- P25 E. Pichot, V. Brandel, B. Chassigneux, N. Dacheux and **M. Genet**, *Irradiation effects on thorium phosphate-diphosphate.*
- P26 **C. Fournier**, A. Dariel, C. Merlet, C. Fucili and O. Dugne, *Surface effects in quantification of uranium materials by EPMA.*
- P27 P. Boulet and **H. Noël**, *Phase relations and properties in the ternary system U-Au-Sn.*
- P28 **P. Salamakha** and O. Sologub, *Constitution and structural chemistry of the ternary system U-Au-Si at 870 K.*
- P29 **P. Salamakha** and O. Sologub, *X-Ray Investigations of the ternary UM<sub>x</sub>Si<sub>2-x</sub> alloys at 870 K.*
- P30 **O. Sologub** and P. Salamakha, *Isothermal sections of the U-V-(Si, Ge) systems at 870 K.*
- P31 **J. C. Waerenborgh**, A. P. Gonçalves and M. Almeida, *Magnetization of the Fe sublattices in UFe<sub>x</sub>Al<sub>12-x</sub> (4 ≤ x ≤ 5.8) studied by Mössbauer spectroscopy.*
- P32 **F. Wastin**, J. Rebizant and E. Colineau, *Short review of the transuranium ternary intermetallic compounds database.*
- P33 **R. Lafolie**, *Analysis of radioactive and nuclear materials by inductively coupled plasma mass spectrometry.*
- P34 **Y. Shiokawa**, H. Yamana and T. Moriyama, *A consideration on the feasibility for*

utilization of neptunium.

- P35 **A. Bilewicz** and **B. Bartos**, *Preliminary results of determination of ionic radius of  $\text{No}^{3+}$ .*
- P36 **J. Stepien-Damm**, **V. Zaremba** and **V. Glukhyj**, *Crystal structure of new  $\text{UCu}_5\text{X}$  ( $\text{X}=\text{In}, \text{Sn}$ ) ternary compounds.*
- P37 **E. S. German**, **E. Firsova**, **T. Khijniak**, **N. Lyalikova**, **K. Guerman** and **V. Peretroukhin**, *Studies of neptunium behaviour in freshwater eutrophic and dystrophic lakes.*
- P38 **S. Stefanovsky**, **S. Yudintsev**, **B. Omelianenko** and **B. Nikonov**, *Speciation of U and REEs in the murataite ceramics for actinide waste immobilization.*
- P39 **C. Rivière**, **C. Madic**, **M. Ephritikhine**, **S. Cendrowsky-Guillaume** and **M. Nierlich**, *Complexation of trivalent M(III) iodides ( $\text{M}=\text{U}, \text{Ce}, \text{Nd}$ ) with bipyridine in anhydrous pyridine studied by  $^1\text{h}$  NMR.*
- P40 **M. R. Silva**, **J. A. Paixão**, **A. M. Beja**, **J. Martin-Gil**, *Crystal structure of l-argininium- tris(acetato) dioxouranate water acetic acid solvate.*
- P41 **A. Carvalho**, **V. Garcia-Montalvo**, **A. Domingos**, **R. Cea-Olivares**, **N. Marques** and **A. Pires de Matos**, *Synthesis and characterization of thorium and uranium tetraphenylimidophosphinate complexes. Crystal and molecular structures of  $\text{Th}(\text{tpip})_4$ ,  $\text{U}(\text{tpip})_4$  and  $\text{UCl}(\text{tpip})_3$ .*
- P42 **R. Dias**, **M. Silva**, **A. Domingos** and **N. Marques**, *Synthesis and structure of  $\text{Tp}^{\text{Ms}}$  and  $\text{Tp}^{\text{Ms,Me}}$  anchored U(IV) compounds.*

*29<sup>èmes</sup> Journées des Actinides Programme*

Wednesday 14	Thursday 15	Friday 16	Saturday 17	Sunday 18
8:50-9:15	Welcome Address	B. COOPER	P. WACHTER	Departure
9:15-9:40	G. H. LANDER	M. BOIVINEAU	D. KOLBERG	
9:40-10:05	S. L. DUDAREV	T. GOUDER	R. AHUIA	
10:05-10:30	D. MANNIX	N. BACLET	A. BOMBARDI	
10:30-10:55	P. OPPENEER	J. MARMEGGI	O. VOGT	
10:55-11:25	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>	
11:25-11:50	R. TROC	G. CHOPPIN	L. HAVELA	
11:50-12:15	C. CARDOSO	L. R. AVENS	M. BROOKS	
12:15-12:40	L. H. SANDRATSKII	W. J. EVANS	M. RICHTER	
12:40-13:05	S. SÉRIO	I. MAY	M. MELAMUD	
13:05	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	
15:30-17:00		Posters		
17:00-17:20	<i>Tea Break</i>	<i>Tea Break</i>	<i>Tea Break</i>	
17:20-17:45	D. LEROY	E. COLINEAU	M. BEAUVY	
17:45-18:10	I. BONHOURE	A. MARTIN-MARTIN	K. GUERMAN	
18:10-18:35	U. WENZEL	A. ANDREEV	P. ROGL	
18:35-19:00	M. S. EISEN	M. KUZNETZ	J. A. PAIXÃO	
19:00-19:25	J. P. LEAL	-	Concluding Remarks	
19:30-21:00	<i>Dinner</i>	<i>Conference Dinner</i>	<i>Dinner</i>	
21:00-22:30	Posters			