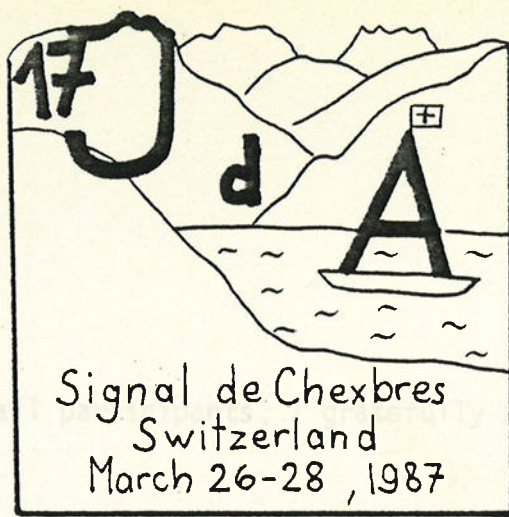


G. H. Lander



In the name of a... knowledge the  
support of the  
University of Lausanne,  
Swiss Academy of Sciences (SSSN-SNG),  
National Energy Research Foundation (NEFF),

# 17ÈMES JOURNÉES DES ACTINIDES

Forces Motrices Bernoises.

I thank the following organizations and persons for putting  
material at our disposal:

- Société de Banque Suisse,
- Banque Cantonale Vaudoise,
- Office Vaudois du Tourisme,
- OMEGA Sports Timing,

## PROGRAM

## ABSTRACTS

## LIST OF PARTICIPANTS

My special thanks are due to Mrs Claudine Bovey for her  
unrelenting work before and during the Conference. I also  
greatly appreciate the help of Mrs M. Süß and Mr P. Giannozzi

Paul Erdős

Organized by  
Paul Erdős  
Institut of Theoretical Physics  
University of Lausanne  
CH-1015 Lausanne, Switzerland

In the name of all participants, I gratefully acknowledge the support of the

University of Lausanne,  
Swiss Academy of Sciences (SSSN-SNG),  
National Energy Research Foundation (NEFF),  
S.A. L'Energie de l'Ouest-Suisse,  
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OMEGA Sports Timing,  
M. Rittener, Section de physique de l'Université de Lausanne.

My special thanks are due to Mrs Claudine Bovey for her unremitting work before and during the Conference. I also greatly appreciate the help of Mrs M. Sütö and Mr P. Giannozzi.

Paul Erdős

Lausanne, March 1987.

## C O N T E N T S

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General information	2
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Program of oral presentations and time schedule of poster sessions and meals	4
Program of poster sessions A (mainly Chemistry)	10
Program of poster sessions B (mainly Physics)	11
Abstracts	14
List of participants	145

### G e n e r a l   i n f o r m a t i o n

Organizers wear colored badges.

Registration fee, which includes hotel room, full board, coffee and pause refreshments are to be paid at arrival to Mrs Claudine Bovey, conference secretary. Hotel extras, such as children's bed, additional nights' stay, beverages served in room or at meals are to be paid to the hotel cashier. Please announce all arrival and departure dates different from Wed. 25 and Sat. 28 to Mrs Bovey. Direct inquiries about train and plane schedules to Mrs Bovey, Mrs Sütö or the hotel secretariat. Arrange transportation to and from the hotel by car with Mr. Giannozzi.

Accompanying persons see the organizers for suggested visits.

#### Oral presentations.

A total of 15 minutes is allowed for each communication, including discussion. After 10 minutes, a warning light is turned on by the chairman. After another 2 minutes, a red light is lit. This leaves 3 minutes for discussion.

#### Posters.

Please mount all posters Thursday after lunch and remove them Saturday before lunch. Because of the large number of posters, and because of the special session on the synchrotron source, some poster sessions had to be scheduled parallel to oral sessions. It has been attempted to minimize conflicts of interest.

P R O G R A M O U T L I N E

Thursday, March 26, 1987		Friday, March 27, 1987		Saturday, March 28, 1987	
8.00 - 8.45	Registration				
9.00 - 9.30	Opening Session	9.00 - 10.30	V. Magnetism 2	9.00 - 10.00	IX. Synthesis, Absorption, Characterization
9.40 - 10.40	I. Electronic Structure 1			9.00 - 10.00	Posters B (Physics Theory and Systematics)
10.40 - 11.00	Coffee break	10.30 - 10.50	Coffee break	10.00 - 10.30	Coffee break
11.00 - 12.15	II. Electronic Structure 2	10.50 - 12.20	VI. Magnetism 3 Crystal Fields	10.30 - 11.30	Summary
12.30	Lunch	12.30	Lunch	12.00	Lunch
15.00 - 16.00	Posters A Mainly Chemistry	15.00 - 17.00	Posters B Physics Experiments		
16.00 - 17.15	III. Heavy Fermions 1				
17-15 - 17.35	Coffee break	17.00 - 17.20	Coffee break		
17.35 - 18.15	IV. Heavy Fermions 2 Magnetism 1	17.20 - 18.20	VII. Spectroscopy		
18.50 - 20.30	Dinner	18.20 - 19.35	VIII. Complexes, Applications		
20.30 - 21.30	Special Session for people interested in a Synchrotron Source	20.00	Conference Dinner		
20.30 - 22.00	Posters A (continued)				

P R O G R A M

WEDNESDAY, MARCH 25, 1987

- 16.00 - 22.00 REGISTRATION  
 19.00 - 22.00 DINNER (Any time within this period)

THURSDAY, MARCH 26, 1987

- 8.00 - 8.45 REGISTRATION (Continued)  
 9.00 - 9.30 OPENING SESSION  
 Welcome addresses by P. ERDÖS, Conference Chairman, P. DUVOISIN, President of State Council of the Canton de Vaud, and a representative of the University of Lausanne.
- 9.40 - 10.40 SESSION I. ELECTRONIC STRUCTURE 1.  
 Abstracts : see p. 15 - 20  
 Chairperson : B. COOPER
- I-1. The Low Temperature Heat Capacity of Protoactinium Metal*  
R.O.A. Hall, A.J. Jeffrey, M.J. Mortimer, J.C. Spirlet
- I-2. The Influence of Relativistic Effects on the Properties of Heavy Element Compounds*  
 G.V. Ionova, V.G. Pershina, V.I. Spitsyn
- I-3. Photoemission and Ion Scattering Studies on Metallic Actinide Glasses*  
 P. Oelhafen, G. Indlekofer, H.J. Güntherodt, M.H. Tuilier, R. Riedinger, W. Scheidt, K. Lüders
- I-4. X-Ray Absorption Studies at M-Edges of Uranium and Neptunium Compounds*  
L. Soderholm, E.E. Alp, D. Hinks, G.K. Shenoy, D.E. Ellis
- 10.40 - 11.00 COFFEE BREAK  
 11.00 - 12.15 SESSION II. ELECTRONIC STRUCTURE 2.  
 Abstracts : see p. 21 - 28  
 Chairperson : O. VOGT
- II-1. Structural Phase Transition in PuTe under Pressure*  
S. Dabos, U. Benedict, J.C. Spirlet, M. Pages
- II-2. Local Density Calculation of Ligand Fields for Actinides*  
G.L. Goodman

Thursday, March 26, 1987 (Continued)

II-3. *Study of the Surface Electronic Structure of fcc Plutonium*

B.R. Cooper, Y.G. Hao, G.W. Fernando

II-4. *Spin-Orbit Effects in the Energy Bands of Actinide Transition Metal Intermetallics*

M.S.S. Brooks, O. Eriksson, B. Johansson

II-5. *Electronic Structure of the Pseudobinary Compounds  $U(Rh_x Pd_{1-x})$*

O. Eriksson, B. Johansson, M.S.S. Brooks, H.L. Shriver

12.30 LUNCH

Please mount all posters after lunch

15.00 - 16.00 POSTERS, SESSION A.

See p. 10

16.00 - 17.15 SESSION III. HEAVY FERMION SYSTEMS 1.

Abstracts : see p. 29 - 37

Chairperson : V. SECHOVSKY

III-1. *Is PuTe a Lightweight Heavy Fermion ?*

F. Marabelli, P. Wachter

III-2. *URu<sub>2</sub>Si<sub>2</sub> : A Heavy Fermion System with Four Characteristic Temperatures*

J. Schoenes, C. Schönenberger, J.J.M. Franse, A.A. Menovsky

III-3. *Study of the Magnetic Ordering in NpRu<sub>2</sub>Si<sub>2</sub> by Neutron Diffraction and Mössbauer Spectroscopy*

D. Bonnissseau, M. Bogé, P. Burlet, J.M. Fournier, S. Quezel, J. Rossat-Mignod, J.C. Spirlet, J. Rebizant

III-4. *Stability of Magnetic Order in Heavy Electron NpBe<sub>13±x</sub>*

J. Gal, F.J. Litterst, W. Potzel, J. Moser, L. Asch, G.M. Kalvius, S. Fredo, S. Tapuchi

III-5. *Phase Diagram of the U<sub>1-x</sub>Th<sub>x</sub>Be<sub>13</sub>-System*

U. Rauchschalbe, F. Steglich, K. Maki, P. Fulde, G.R. Stewart

17.15 - 17.35 COFFEE BREAK

17.35 - 18.35 SESSION IV. HEAVY FERMION SYSTEMS 2 - MAGNETISM.

Abstracts : see p. 38 - 43

Chairperson : W. SUSKI

IV-1. *Magnetoacoustic Effects in UPt<sub>3</sub>*

I. Kouroudis. B. Lüthi, G. Bruls, U. Welp

IV-2. *Normal Ground-State Properties of Heavy-Fermion Actinide Systems*

H. Rietschel, F. Gompf, B. Renker, R. Felten, F. Steglich, G. Weber

Thursday, March 26, 1987 (Continued)

IV-3. *Electronic and Magnetic Properties of NpSb and NpTe Studied by  $^{237}\text{Np}$ ,  $^{121}\text{Sb}$  and  $^{125}\text{Te}$  Mössbauer Spectroscopies*

J.P. Sanchez, J. Rebizant, J.C. Spirlet, O. Vogt

IV-4. *Development of Magnetism in UTX Compounds*

V. Sechovsky, L. Havela, A.P. Veenhuizen, F.R. de Boer

18.50 DINNER

20.30 - 21.30 SPECIAL SESSION. ACTINIDE BEAM-LINE AT A SYNCHROTRON SOURCE.

Abstract : see p. 14

Chairperson : W. MÜLLER

1. *Scientific Potential of such Studies* : G. Kaindl

2. *Feasibility Studies* : J. Naegele

3. *E S R F* : G. Lander

20.30 - 22.00 POSTERS SESSION A (Continued)

See p. 10

FRIDAY, MARCH 27, 1987

9.00 - 10.30 SESSION V. MAGNETISM 2.

Abstracts : see p. 44 - 54

Chairperson : J. ROSSAT-MIGNOD

V-1. *Magnetic Moments and Pu Form Factor in PuFe<sub>2</sub>*

M. Wulff, G.H. Lander, J. Rebizant, J.C. Spirlet, B. Lebech,  
C. Broholm, P.J. Brown

V-2. *Transition Temperatures in PuSb*

A. Blaise, R.O.A. Hall, J.A. Lee, M.J. Mortimer, J. Rebizant,  
J.C. Spirlet

V-3. *Magnetism of Ternary Actinoid Gallides : U{Fe,Co,Ni,Ru,Rh,Pd,  
Os,Ir,Pt}Ga<sub>5</sub>*

K. Hiebl, Y.N. Grin, P. Rogl, H. Noël

V-4. *Magnetic Properties of UT<sub>2</sub>X<sub>2</sub> /T=Mn,Fe,X=Si,Ge/*

A. Szytula, S. Siek, J. Leciejewicz, A. Zygmunt, Z. Ban

V-5. *Magnetization Measurements on Plutonium Chalcogenide Single  
Crystals*

O. Vogt, K. Mattenberger, J. Rebizant, J.C. Spirlet

V-6. *Magneto-optical Properties of Ferromagnetic UCuP<sub>2</sub>*

P. Fumagalli, J. Schoenes, R. Troc

10.30 - 10.50 COFFEE BREAK

Friday, March 27, 1987 (Continued)

10.50 - 12.20

SESSION VI. MAGNETISM AND CRYSTAL-FIELD

Abstracts : see p. 55 - 62

Chairperson : M. KUZNIETZ

VI-1. *Crystal-Field and Magnetic Phase Transition in  $UI_3$  Studied by Means of Neutron Scattering*

A. Murasik, A. Furrer, P. Fischer, W. Szczepaniak

VI-2. *MFA Theory of the First Phase Transition in  $UO_2$*

Z. Zolnierek

VI-3. *Neutron Inelastic Experiments to Determine the Crystal-Field Levels in  $NpO_2$*

S.F. Kern, C.K. Loong, G. Goodman, G.H. Lander, B. Cort

VI-4. *Magnetic Properties of  $UBr_3$*

R. Lyzwa, P. Erdős

VI-5. *Interactions hyperfines dans des oxoneptunates alcalins et alcalino-terreux hexavalents*

J. Jové, T. Thévenin, A. Cousson, E. Soulié

12.30

LUNCH

15.00 - 17.00

POSTERS. SESSION B.

See p. 11 - 12

17.00 - 17.20

COFFEE BREAK

17.20 - 18.20

SESSION VII. SPECTROSCOPY

Abstracts : see p. 63 - 67

Chairperson : H. BARTHOLIN

VII-1. *Anomalous Crystalline Electric Field (C.E.F.) Excitations in  $UCl_4$*

P. Delamoye, W. Reichardt, C. Vettier, J.C. Krupa

VII-2. *Optical and EPR Studies of  $Np^{4+}$  Diluted in  $ZrSiO_4$*

I. Poirot, W. Kot, G. Shalimoff, N. Edelstein, M.M. Abraham, C.B. Finch, L.A. Boatner

VII-3.  *$L_3$ -Edge X-Ray Absorption Study of Light-Actinide Compounds*

G. Kaindl, G. Kalkowski, S. Bertram, G. Schmiester, J. Rebizant, J.C. Spirlet, O. Vogt

VII-4. *Photoemission Study of Surface Oxidation of Np-Metal*

J.R. Naegele, L.E. Cox, J. Ward

Friday, March 27, 1987 (Continued)

18.20 - 19.35 SESSION VIII. COMPLEXES, APPLICATIONS.

Abstracts : see p. 68 - 74

Chairperson : J. FUGER

VIII-1. *Correlations between Molecular Structure and Paramagnetism in Organometallic Compounds of the Tetravalent Uranium*

B. Kanellakopoulos, Ch. Apostolidis, B. Powietzka

VIII-2. *The Electronic Structure of Trigonal and Trigonal-Bipyramidal Complexes involving the Tris(Cyclopentadienyl)-Uranium(IV) Moiety*

H.D. Amberger, H. Reddmann

VIII-3. *The Crystal Structure of  $\text{UCp}_3\text{Cl}$ , Uranium Chloride*

$\pi$ -Tricyclopentadienyl

A. Delapalme, P. Schweiss, M.R. Spirlet, B. Kanellakopoulos, J. Rebizant

VIII-4. *The Analysis of the Complexation Characteristics Variation Across the Lanthanide Series*

V.G. Vokhmin, G.V. Ionova

VIII-5. *Etude de la détection par spectrométrie alpha des radio-colloïdes recueillis sur membrane après ultrafiltration*

P. Müller, C. Degueldre

20.00

CONFERENCE DINNER

SATURDAY, MARCH 28, 1987

9.00 - 10.00 SESSION IX. SYNTHESIS, ADSORPTION AND CHARACTERIZATION.

Abstracts : see p. 75 - 80

Chairperson : C. BÜNZLI

IX-1. *The Crystal Growth and Characterization of Uranium Ternary Intermetallics*

A.A. Menovsky

IX-2. *Photoemission Study of the CO Adsorption on U,  $\text{UNi}_2$  and  $\text{UNi}_5$*

T. Gouder, C. Colmenares, J. Naegele, J. Spirlet, J. Verbist

IX-3. *Potassium and Rubidium Tetra- and Hexachloruranates (iii)*

J. Drozdzyński (not received)

IX-4. *Search for Lr as a P-Element Using On-Line Isothermal Gasphase Chemistry*

D.Lee, H.Hall, R.Chasteler, R. Henderson, M.Schädel  
H. Gäggeler, D.T. Jost, B. Eichler, K. Gregorich, D.C. Hofmann,

9.00 - 10.00 POSTERS. SESSION B (Continued)

See p. 11 - 12

Saturday, March 28, 1987 (Continued)

10.00 - 10.30 COFFEE BREAK  
10.30 - 11.30 SUMMARY  
Chairperson : M. PAGES  
12.00 LUNCH

*Please remove your posters by 12 a.m.*

*Rooms should be vacated by 10 a.m. and luggage deposited  
in the luggage room.*

The 18èmes Journées des Actinides will be held 1988  
in Paris and will be organized by Monique Pagès.

P O S T E R S

SESSION A. MAINLY CHEMISTRY

Abstracts : see p. 82 - 101  
 First part : Thursday, March 26, 1987, 15.00 - 16.00  
 Second part : " " " " 20.30 - 22.00  
 All posters A-1 / A-12 are exposed in both parts of the Session.

- A- 1. *Sorption of Neptunium on Clays*  
S. Aksoyoglu
- A- 2. *Determination of Traces of Thorium and Neptunium in Plutonium Nitrate Solutions*  
 O. Cromboom, H. Kutter, M. Ougier, Ch. Apostolidis, H. Bokelund
- A- 3. *Application du comptage alpha par scintillation liquide pour la détermination du  $^{237}\text{Np}$*   
C. Degueudre
- A- 4. *Preparation and Study of Indenyl Compounds*  
 S. Bettonville, J. Goffart
- A- 5. *A New Chemical Family : The Niobo Uranates*  
M. Gasperin
- A- 6. *DI-N-Butyl Phosphoric Complexes of Tetravalent Actinides*  
J. Livet, C. Musikas, L. Toupet
- A- 7. *Synthetic Efforts Toward Americium(II) Chlorides*  
L.R. Morss, Th. Schleid, J.A. Fahey, G. Meyer
- A- 8. *Tris-Cyclopentadienyl Uranium Siloxide*  
 M. Porchia, N. Brianese, F. Ossola, G. Rossetto, P. Zanella
- A- 9. *Preparation and Structure of New Ternary Intermetallic Compounds of Actinide*  
J. Rebizant, J.C. Spirlet, E. Bednarczyk, T. McMenamin and K. Rijkeboer
- A-10. *New Extractants with Hydroxydiphosphonic Function for Actinides and Lanthanides*  
J.P. Silvestre, L. Matutano, N.Q. Dao, A. Maher, D. Pareau
- A-11. *Physically Attainable Ratios of the Nephelauxetic Changes of the Racah Parameters for f Elements*  
V.G. Vokhmin, G.V. Ionova
- A-12. *Synthesis of Intermetallic Actinide Compounds :  $\text{AnPb}_3$*   
J. Larroque, M. Beauvy
- A-13. *Extraction of 4f and 5f Elements with Substituted Malconamides*  
C. Cuillerdier, H. Hubert, P. Hoel, C. Musikas

P O S T E R S

SESSION B. MAINLY PHYSICS

Abstracts : see p. 102 - 143  
 First part : Friday, March 27, 1987, 15.00 - 17.00  
 Second part : Saturday, March 28, 1987, 9.00 - 10.00  
 All posters are exposed in both parts of the Session.

B-1 - B-13 : EXPERIMENTS. Abstracts see p. 102 - 122

- B- 1. *Electrical Resistivity of  $U_{1-x}Th_xA_5$  Solid Solutions*  
H. Bartholin, C. Breandon, R. Tchapotian, J. Schoenes, O. Vogt
- B- 2. *Mössbauer Spectroscopy on NpSe*  
D. Bonniseau, M. Bogé, J.C. Spirlet, J. Rebizant
- B- 3. *Magnetic Ordering of NpSb*  
D. Bonniseau, S. Quezel, P. Burlet, J. Rossat-Mignot, O. Vogt, J.C. Spirlet,  
 J. Rebizant
- B- 4. *On the Low-Temperature Behavior of UIr-UPt*  
 H. Brändle, A. Dommann, F. Hulliger, J. Schoenes
- B- 5. *Magnetic and Related Properties of the  $UCu_{4.5}Al_{7.5}$*   
 M. Drulis, A. Baran, W. Suski
- B- 6. *Electrical Resistivity of PuSe*  
 J.M. Fournier, P.G. Thérond, J. Rebizant, J.C. Spirlet, O. Vogt
- B- 7. *Structural, Magnetic and Electrical Properties of Ternary U-(Cu,Ni)-(P,As) Phase*  
D. Kaczorowski, R. Troc
- B- 8. *L III Absorption of Uranium in Glassy Pd-U-Si Alloys*  
M.H. Tuilier, R. Riedinger, P. Oelhafen, R. Zehringer, G. Indlekofer
- B- 9. *Magnetic Properties of Liquid Uranium and Pd-U-Si Alloys*  
H. Jenny, H.J. Güntherodt
- B-10. *Laser Induced Fluorescence of  $^{249}Bk^{4+}$  in  $CeF_4$*   
 G.M. Jursich, J.B. Beitz, W.T. Carnall, G.L. Goodman, C.W. Williams, L.R. Morss
- B-11. *Neutron Diffraction Study of  $UAs_{0.75}Se_{0.25}$  Single Crystal in an Applied  
 Magnetic Field*  
M. Kuznietz, P. Burlet, J. Rossat-Mignod, O. Vogt
- B-12. *Crystal Structure and Magnetic Properties of  $U_2MO_3SI_4$  and  $U_2MO_3GE_4$*   
H. Noël, A. Zygmunt
- B-13. *Magnetic Properties of Orthorhombic Uranium Ternary Compounds with  $CeCu_2$  Type  
 of Crystal Structure*  
R. Troc, T.V. Hung

- B-14. *Synthesis and Magnetic Properties of Diborides of Neptunium and Plutonium*  
R. Chipaux, J. Larroque, M. Beauvy, A. Blaise, D. Bonnissseau
- B-15 - B-24 THEORY AND SYSTEMATICS. Abstracts see p. 125 - 143
- B-15. *On the Interpretation of Crystal Field Transitions in Uranium Dioxide*  
G. Amoretti
- B-16. *UCoAl - What is the Ground State ?*  
 A.V. Andreev, N.V. Baranov, V.I. Krylov, J.M. Fournier, L. Havela, V. Sechovsky
- B-17. *Canonical Transformation for Mixed Valence Compounds*  
M. Drzazga, M. Szopa, E. Zipper
- B-18. *Theoretical Analysis of the 3-K Magnetic Structure and Distortion of Uranium Dioxide*  
P. Giannozzi, P. Erdős
- B-19. *Uranium Laves Phases with Early d Metals*  
L. Havela, V. Sechovsky, A.V. Andreev
- B-20. *5f Magnetism in  $U_xTh_{1-x}CoSn$*   
L. Havela, V. Sechovsky, A.V. Andreev, V.I. Krylov, A.P. Veenhuizen,  
 F.R. de Boer, N. Pillmayr, G. Hilscher
- B-21. *Charge Density Distribution and Mössbauer Isomer Shifts in the Neptunium Compounds*  
 G.V. Ionova, V.G. Pershina, V.I. Spitsyn
- B-22. *Electronic Structure of the UTe Alloy*  
A. Jezierski, N.C. Christensen
- B-23. *Effect of Correlation and Hybridization in a Two-Band Model for Indirect Exchange*  
P. Monachesi, M. Acquarone
- B-24. *Resistivity in Dynamic Alloy Model*  
E. Zipper, A. Freimuth, M. Drzazga

### "Actinide beam-line at a Synchrotron source"

The use of synchrotron radiation is rapidly increasing in condensed matter science and in the last few years there have been a number of reports on such studies of uranium and its compounds. However, the possibility of performing these studies on transuranium isotopes is extremely limited and for many studies such as photoemission or systems under pressure does not exist. Starting with a Workshop at Karlsruhe in November 1985 there has been increasing interest in providing a "actinide beam-line" at a European synchrotron source.

To discuss the scientific potential and the steps taken so far a short (1 hr) evening session will take place at the J. des Actinides. This is open to all interested scientists.

The session will take place on

Thursday, March 26,  
at 20.30 hrs  
in a room to be announced  
at the Journée.

Speakers will be:

G. Kaindl (Freie Universität, Berlin)  
"Scientific potential of such studies"

J. Naegele (Transuranium Institute, Karlsruhe)  
"Feasibility studies"

G. Lander (TU, Karlsruhe)  
"ESRF proposal and funding possibilities"

We welcome your attendance and hope we can develop a strong European effort in this important field.