

CONFÉRENCE EUROPÉENNE DE PHYSIQUE NUCLÉAIRE
EUROPEAN CONFERENCE ON NUCLEAR PHYSICS

AIX-EN-PROVENCE

26 Juin - 1^{er} Juillet 1972

Patronnée par

LA SOCIÉTÉ FRANÇAISE DE PHYSIQUE

et

LA SOCIÉTÉ EUROPÉENNE DE PHYSIQUE

COMPTES RENDUS DES COMMUNICATIONS

publiés avec le concours de Madeleine PORNEUF

Cette Conférence est dédiée à la
mémoire de Claude BLOCH (1923-1971)

*This Conference is dedicated to the
memory of Claude BLOCH (1923-1971)*

La Première Conférence Européenne de Physique Nucléaire, Aix-en-Provence 26 juin - 1 juillet 1972 - a été organisée sous l'égide de la Société Européenne de Physique et de la Société Française de Physique. Sa préparation a été confiée à un Comité Scientifique International et à un Comité d'Organisation Français.

Pour donner à cette Conférence un caractère pluridisciplinaire tout en lui conservant une dimension raisonnable, les Comités ont décidé de développer le programme autour des trois thèmes suivants : I Fission, II Spectrométrie Nucléaire avec Ions Lourds, III Physique Nucléaire au-dessus de 100 MeV.

La Conférence a bénéficié du soutien du Ministère de l'Education Nationale, de l'Institut National de Physique Nucléaire et de Physique des Particules et de la Direction de la Physique du Commissariat à l'Energie Atomique.

Les Comités remercient vivement l'Université de Provence et son Président, Monsieur le Professeur F. Borel, pour avoir mis à leur disposition les locaux de la Faculté des Lettres et des Sciences Humaines d'Aix-en-Provence, ainsi que le Centre d'Etudes Nucléaires de Cadarache et son Directeur, Monsieur R. Faure, pour l'organisation locale.

Les Comités remercient très vivement pour leur contribution financière les Sociétés suivantes : Creusot-Loire, Framatome, High-Voltage Engineering Corporation (Radian), I.B.M., Varian S.A.

V. Gillet et G. Ripka
Secrétaires de la Conférence

The First European Nuclear Physics Conference in Aix-en-Provence - June 26 - July 1, 1972 - was organized under the sponsorship of the European Physical Society and the Société Française de Physique. The Conference has been prepared by an International Scientific Committee and by a French Organizing Committee.

In order to give the Conference a pluri-disciplinary character while keeping it within a reasonable size, the Committees have decided to center the programme around the three following topics : I Fission, II Nuclear Spectroscopy with Heavy Ions, III Nuclear Physics above 100 MeV.

The Conference is supported by the Ministère de l'Education Nationale, the Institut National de Physique Nucléaire et de Physique des Particules and the Direction de la Physique du Commissariat à l'Energie Atomique.

The Committees wish to thank the Université de Provence and its President, Professor F. Borel, for allowing the Conference to be held on the premises of the Faculté des Lettres et des Sciences Humaines of Aix-en-Provence, and the Centre d'Etudes Nucléaires de Cadarache and its Director, Monsieur R. Faure, for the local organization.

The Committees gratefully acknowledge the financial support of the following Companies : Creusot-Loire, Framatome, High-Voltage Engineering Corporation (Radian), I.B.M., Varian S.A.

V. Gillet and G. Ripka
Conference Secretaries

COMITE SCIENTIFIQUE INTERNATIONAL - SCIENTIFIC INTERNATIONAL COMMITTEE

V.V. BALASHOV, *Moscou*
C. BLOCH, *Saclay*
R. BOCK, *Heidelberg*
A. BOHR, *Copenhagen*
M. DEMEUR, *Bruelles*
K. DIETRICH, *Munich*

G.N. FLEROV, *Dubna*
S.G. NILSSON, *Lund*
C. SCHAEFER, *Frascati*
J. TEILLAC, *Paris*
G. TIBELL, *Uppsala*
D.H. WILKINSON, *Oxford*

COMITE D'ORGANISATION FRANCAIS - FRENCH ACTING COMMITTEE

Y. ABGRALL, *Bordeaux*
P. CHEVALLIER, *Strasbourg*
E. COTTON, *Saclay*
H. FARAGGI, *Saclay*
V. GILLET, *Saclay*
M. GUSAKOW, *Lyon*
M. LEFORT, *Orsay*
J. LEROY, *Cadarache*

J. MANDELBROJT, *Marseille*
A. MESSIAH, *Saclay*
A. MICHAUDON, *Saclay*
P. RADVANYI, *Orsay*
M. RIOU, *Orsay*
G. RIPKA, *Saclay*
J. THIRION, *Saclay*
M. VENERONI, *Orsay*
J. YOCCOZ, *Paris*

Secrétaires de la Conférence : V. GILLET, *Saclay*
Conference Secretaries G. RIPKA, *Saclay*

Secrétaire Administrative : Mme M.S. DETOEUF, *IN2P3*
Administrative Secretary

Organisation Locale : R. VIOLLET, *Cadarache*
Local Organisation

T A B L E D E S M A T I E R E S - C O N T E N T S

I - FISSION

Barrières de Fission - Fission Barriers

- I.1 - Constrained Hartree-Fock Calculations of ^{240}Pu - *H. Flocard, P. Quentin and D. Vautherin* 3
- I.2 - Constrained Hartree-Fock Calculations for $A < 200$ Nuclei - *H. Flocard, P. Quentin and D. Vautherin* 4
- I.3 - Semi-Empirical Shell Correction in the Fission of Heavy and Superheavy Nuclei - *R. Schultheis and H. Schultheis* 5
- I.4 - Evaluation of Fission Barrier Parameters from Near Barrier Fission and Isomeric Half Life Data - *H. Weigmann and J.P. Theobald* 6

Isomères De Fission - Fission Isomers

- I.5 - Subnanosecond and Nanosecond Double Fission Isomer in the Even-Even ^{238}Pu - *P. Limkilde and G. Sletten* 7
- I.6 - Identification of a Rotational Band in the ^{240m}Pu Fission Isomer - *H.J. Specht, E. Konecny, D. Heunemann and J. Weber* 8
- I.7 - Search for Fission Isomers with ^{14}N and Alpha Particle Reactions - *D.A. Eastham and I.S. Grant* 9

Mécanismes de Fission - Fission Mechanisms

a - Théorie et Calculs - Theory and Calculations

- I.8 - Sequential Reaction Processes in Nuclear Fission - *K. Izumo* 10
- I.9 - Two Different Mechanisms Proposed for Symmetric and Asymmetric Fission of Heavy Nuclei - *U. Facchini and E. Saetta-Menichella* 11
- I.10- One-Particle Motion in Guide Potentials and Analogies to the Collective Motion of Nuclei - *W. Nörenberg* 12
- I.11- Sur les Résonances au-dessus du Seuil de Fission de ^{232}Th , ^{231}Pa et ^{234}U par Neutrons Rapides - *T.P. Doan, A. Sicre, B. Leroux et R. Chastel* 13
- I.12- Fission, Fusion and Heavy Ion Scattering in the Liquid-Drop Model - *R.W. Hasse* 14
- I.13- Removal of the Spurious State from the Cranking Mass Formula - *F. Dickmann, K. HARA and H. Hofmann* 15
- I.14- S-Matrix Formulation, Dynamics and Models of the Fission Process - *W. Nörenberg* 16

b - Résultats Expérimentaux - Experimental Results

- I.15 - The Variation in Fragment Total Kinetic Energy with Excitation Energy in Fission of ^{240}Pu Induced by the $^{239}\text{Pu}(d, pf)$ Reaction - *J.C.D. Milton, J.S. Fraser and H.J. Specht* 17
- I.16 - High Energy Photonuclear Reactions - *P. David, J. Debrus, U. Kim, F. Lübke, H. Mommsen R. Schoenmackers, W. Soyez, K.H. Speidel and G. Stein* 18
- I.17 - Ratio of the Ternary (LRA) to Binary Fission Cross-Section for ^{235}U in the Resonance Region (below 40 eV) - *C. Wagemans and A.J. Deruytter* 19
- I.18 - Spin Assignments of ^{235}U Neutron Resonances and Estimate of $\langle \Gamma_f \rangle$ for $J^\pi = 3^-$ and 4^- Levels *F. Corvi, M. Stefanon, C. Coceva and P. Giacobbe* 20
- I.19 - Structure Intermédiaire dans la Section Efficace de Fission de ^{237}Np - *S. Plattard, A. Michaudon et D. Paya* 21
- I.20 - Mise en Evidence d'une Structure Intermédiaire dans la Section Efficace de Fission de ^{239}Pu - *J. Blons, H. Derrien et A. Michaudon* 22
- I.21 - Mesure des Variations du Nombre Moyen $\bar{\nu}$ de Neutrons Prompts Emis lors de la Fission de ^{239}Pu Induite par Neutrons de Résonances - *J. Trochon, B. Lucas et A. Michaudon* 23
- I.22 - Variations in Prompt Neutron and Gamma-ray Yields in Resonance Neutron-Induced Fission of Plutonium-239 - *D. Shackleton, J. Frehaut and M. Le Bars* 24
- I.23 - New Results on the Prompt Neutron Emission by the Individual Fission Fragments of ^{252}Cf - *C. Signarbieux, H. Nifenecker, J. Poitou and M. Ribrag* 25
- I.24 - Experimental Study of the Potential Energy Surface for the Scission Configurations - *H. Nifenecker, R. Babinet and C. Signarbieux* 26
- I.25 - Electro-Fission Below 100 MeV Electron Energy - *J.M. Reid and A.C. Shotter* 27

Désexcitation des Fragments de Fission - De-excitation of Fission Fragments

- I.26 - Detailed Investigation on Prompt Neutron Number Distribution as a Function of Fragment Charge in the Spontaneous Binary and Ternary Fission of ^{252}Cf - *J. Poitou, J. Girard, H. Nifenecker and C. Signarbieux* 28
- I.27 - Even-Odd Effects in the Prompt De-Excitation Process of the Fission Fragments of ^{252}Cf - *H. Nifenecker, J. Girard, J. Matuszek and M. Ribrag* 29
- I.28 - Prompt Electrons from Neutron Induced Fission of U-235 - *T.A. Khan, D. Hofmann and F. Horsch* 30
- I.29 - Decay Properties and Yields of Short-Lived Fission Products in the 50- and 82 Neutron-Shell Region in Thermal-Neutron Induced Fission of ^{235}U - *H. Franz, G. Herrmann, J.V. Kratz and K.L. Kratz* 31
- I.30 - Measurements of Lifetimes and Gamma-Energies on Neutron-Rich Nuclei Produced in the Fission Process - *H. Albinsson* 32
- I.31 - Prompt Fission Neutron Energy Spectrum of ^{235}U at $E_N = 0.4$ MeV - *H.H. Knitter and M.M. Islam* 33

Diffusion Elastique et Mécanismes de Collision - Elastic Scattering and Collision Mechanisms

a - <u>Analyse par le Modèle Optique - Optical Model Analysis</u>	
II.1 - Elastic Scattering of ^{28}Si on ^{29}Si - C.K. Gelbke, R. Bock, H.G. Bohlen, P. Braun-Munzinger, K.D. Hildenbrand, D. Fick, W. Von Oertzen and W. Weiss	37
II.2 - Optical Model Fits to the Elastic Scattering Cross Sections for ^{28}Si on ^{28}Si - M.K. Metha and S.S. Saini	38
II.3 - Optical Model Analysis of ^6Li Elastic Scattering - G. Bassani, A. Foti, G. Pappalardo, J. Raynal, N. Saurier and B.M. Traore	39
II.4 - Size Effects in the Shape Elastic Scattering of Heavy Ions - P. Charles, M. Dost, B. Fernandez and J. Gastebois	40
II.5 - Interference between Coulomb and Nuclear Excitation in Inelastic Scattering of ^{16}O Ions F. Videbaek, I. Chernov and E.E. Gross	41
II.6 - Angular Momentum Effects for $^{16}\text{O} + ^{16}\text{O}$ Scattering Studied via the Reaction Channels - H.H. Rossner, G. Hinderer, A. Weidinger and K.A. Eberhard	42
II.7 - Diffusion Elastique de ^{84}Kr par des Noyaux Lourds - P. Colombani, J.C. Jacmart, N. Poffe, M. Riou, C. Stephan and J. Tys	43
b - <u>Potentiels à Deux Centres - Two-Center Potentials</u>	
II.8 - Heavy Ions Scattering at Low Energy in the Framework of Molecular Orbitals - F. Becker and C. Beccaria	44
II.9 - Resonance Exchange Scattering of Heavy Ions at Low Energy Including Excitations - F. Becker and C. Beccaria	45
II.10 - A Microscopic Theory for the Elastic Interaction of Complex Nuclei - K. Prüss	46
II.11 - Effects of Antisymmetrization on Heavy-Ion Potentials - J.Y. Park, W. Scheid and W. Greiner	47
II.12 - Compression Effects in the Heavy-Ion Potentials - H. Müller, W. Scheid and W. Greiner	48
II.13 - Interaction Nucléaire entre Deux Noyaux ^{12}C - G. Reidemeister	49
c - <u>Conditions de Formation de Noyaux Composés par Ions Lourds</u> <u>Conditions for Compound Nucleus Formation by Heavy Ions</u>	
II.14 - Conditions de Formation de Noyaux Composés Super-Lourds avec un Faisceau de Krypton - B. Tamain, M. Lefort, C. Ngo and J. Peter	50
II.15 - Predictions for Heavy Ion Reactions Based on the Rotating Liquid Drop Model - F. Plasil	51
II.16 - Limits to the Formation of Compound Nuclei in Heavy Ion Induced Reactions - J.B. Natowitz and E.T. Chulick	52

Réactions de Transfert - Transfer Reactions

a - Transfert Sous-Coulombien - Sub-Coulomb Transfer

- II.17 - Subcoulomb Transfer Reactions Induced by ^{16}O on ^{208}Pb and ^{209}Bi - M. Von Oertzen, N. Marquardt and I. Inoue 53
- II.18 - A Study of Neutron Transfer across the Coulomb Barrier - P.J.A. Buttle, J.L. Durell, L.J.B. Goldfarb, J.S. Lilley and W.R. Phillips 54

b - Transferts Simples et Multiples au-dessus de la Barrière
Single and Multiple Transfer above the Coulomb Barrier

- II.19 - A Study of Transfer Reactions Induced by 150 MeV ^{20}Ne on ^{27}Al - F. Pühlhofer, D.G. Kovar, B.G. Harvey, F.D. Becchetti, J. Mahoney, B. Mayer, J.D. Sherman and M.S. Zisman 55
- II.20 - Recoil Study of Transfer Reactions Induced with ^{40}Ar in Heavy Nuclei - R. Bimbot, J. Maison and M.F. Rivet 56
- II.21 - On the Mechanism of Heavy Ion Transfer Reactions - R. da Silveira 57
- II.22 - Heavy Ion Transfer Reactions on ^{208}Pb at Energies Well above the Coulomb Barrier - D.K. Scott, P.N. Hudson, P.S. Fisher, N. Anyas-Weiss, A.D. Panagiotou and D.M. Brink 58
- II.23 - Nucleon Exchange in the Scattering of Carbon Isotopes - H.G. Bohlen, M. Feil, A. Gamp, N. Marquardt, W. Von Oertzen and B. Kohlmeyer 59
- II.24 - Doppler Shift Studies by the $^{90}\text{Zr}(^{13}\text{C}, ^{12}\text{C})^{91}\text{Zr}$ Transfer Reaction - K. Haberkant, E. Grosse, R. Repnow and J.P. Wurm 60

c - Etudes Théoriques des Mécanismes - Theoretical Studies of Reaction Mechanisms

- II.25 - Recoil Effects in DWBA Calculations for Heavy-Ion Reactions - R.M. DeVries 61
- II.26 - Generator-Coordinate Form Factors for Transfer Reactions between Heavy Ions - P. Bonche and B. Giraud 62
- II.27 - A Solution for the Generator-Coordinate Model of α - α Scattering - B. Giraud, J.C. Hocquenghem and A. Lombroso 63
- II.28 - Quantum Mechanical Treatment of Direct Reactions Between Heavy Ions - T. Tamura and H.H. Wolter 64
- II.29 - Analyse DWBA des Multitransferts entre Ions Lourds - E. El Baz, J. Meyer, R. Nahabetian and J. Pigeon 65

d - Réactions de Transfert par Ions de Lithium - Transfer Reactions with Lithium Ions

- II.30 - Study of the $(^7\text{Li}, t)$ Reaction on ^{40}Ca and ^{54}Fe Target at Low Incident Energy - A. Cunsolo, M.C. Lemaire, M.C. Mermaz, J.L. Quebert and H. Sztark 66
- II.31 - Triangle Graph Mechanism in the $^9\text{Be}(^6\text{Li}, t)^{12}\text{C}$ Reaction - T.H. Rihan and O. Zohni 67
- II.32 - Some ^6Li and ^7Li Reactions Induced on Gaseous Targets - G. Bassani, A. Foti, C. Gerardin N. Saurier and M. Wery 68

- II.33 - A Quantitative Study of the ${}^6\text{Li}$ Induced Multi-Nucleon Transfer Reactions - *G. Bassani, R.M. DeVries, A. Foti, G. Pappalardo and N. Saunier* 69
- II.34 - (${}^6\text{Li}, d$) Reaction on Ca Isotopes - *U. Strohmusch, C.L. Fink, B. Zeidman, R.N. Horoshko, H.W. Fulbright and R. Markham* 70
- II.35 - The ${}^{16}\text{O}({}^{14}\text{N}, {}^6\text{Li}){}^{24}\text{Mg}$ Reaction - *M. Conjeaud, P. Gaillard, S. Harar, E. Da Silveira and C. Volant* 71
- II.36 - Study of the (${}^6\text{Li}, {}^6\text{He}$) Reaction on the Boron Isotopes - *S.M. Lee, P. Charles, M. Dost, B. Fernandez, J. Gastebois and T. Kamhuri* 72
- II.37 - Réactions ($d, {}^6\text{Li}$) sur les Noyaux ${}^{40-42}\text{Ca}$, ${}^{56}\text{Fe}$, ${}^{58}\text{Ni}$ à 28 MeV - *J.B. Viano, J.M. Loiseaux Y. Le Chalony and P. Martin* 73

e - Spectroscopie Sélective - Selective Spectroscopy

- II.38 - Is There a Selectivity in the (${}^{16}\text{O}, {}^{12}\text{C}$) Reactions on the Ar Isotopes? - *P. Braun-Munzinger, C.K. Gelbke, N. Grama, H. Homeyer, E. Ridinger and R. Stock* 74
- II.39 - Super-Selectivity in Heavy Ion Transfer Reactions - *D.K. Scott, P.N. Hudson, P.S. Fisher, N. Anyas-Weiss, A.D. Panagiotou, P.J. Ellis and B. Buck* 75
- II.40 - The ${}^{18}\text{O}({}^{12}\text{C}, {}^{10}\text{Be}){}^{20}\text{Ne}$ Reaction - *M. Conjeaud, S. Harar and C. Volant* 76
- II.41 - Alpha-Transfer Reactions Initiated by Heavy Ions Spin Determinations in Residual Nuclei - *A.D. Panagiotou, D.K. Scott, P.S. Fisher, P.N. Hudson, N. Anyas-Weiss, J.C. Cornell and A. Menchaca-Rocha* 77
- II.42 - Study of the Elastic Scattering of ${}^{16}\text{O}$ on ${}^{90}\text{Zr}$ and of the Reaction ${}^{90}\text{Zr}({}^{16}\text{O}, {}^{12}\text{C}){}^{94}\text{Mo}$ at 58 MeV - *Y. Cassagnou, H. Faraggi, G. Morisson and A. Papineau* 78
- II.43 - ${}^{16}\text{O}$ Induced Transfer Reactions on Rare Earths near the Coulomb Barrier - *Y. Cassagnou, M. Laméhi-Rachti, C. Levi, W. Mittig and L. Papineau* 79
- II.44 - Reactions of ${}^{16}\text{O}$ and ${}^{12}\text{C}$ Ions with ${}^{208}\text{Pb}$ - *B.G. Harvey, D.G. Kovar, F.D. Becchetti, F.G. Pühlhoffer, J. Mahoney, J.C. Faivre, M.S. Zisman, J.D. Sherman, B. Mayer, D.W. Miller, A. Giorni, J.R. Meriwether, S.W. Cospers and G.M. Marinescu* 80
- II.45 - Alpha Pickup in the $A = 90$ Region - *C. Detraz, C.D. Zafiratos, H. Rudolph and C.S. Zaidins* 81
- II.46 - Preliminary Results of Determination by Magnetic Analysis of Energies in Reaction ${}^{54}\text{Fe}({}^{16}\text{O}, {}^{12}\text{C}){}^{58}\text{Ni}$ - *L. Bianchi, E. Cotton and A. Papineau* 82
- II.47 - Réactions de Stripping de Deux Nucléons sur le ${}^{54}\text{Fe}$ et le ${}^{58}\text{Ni}$ à l'aide d'un Faisceau de ${}^{16}\text{O}$ de 80 MeV - *E. Pougheon, P. Roussel, P. Colombani, H. Doubre et J.C. Roynette* 83
- II.48 - Reaction Mechanism Study in the $1f-2p$ Shell of (${}^{16}\text{O}, {}^{12}\text{C}$) Four Nucleon-Transfer-Reaction - *P. Bonche, A. Cunsolo, B. Giraud, M.C. Lemaire, M.C. Mermaz and J.L. Quebert* 84

Noyaux Déformés Accessibles par Ions Lourds - Deformed Nuclei Accessible by Heavy Ions

- II.49 - Pear Shaped (Nucleus + α)-Structures in Light Nuclei - *H. Friedrich, H. Hüskens and A. Weiguny* 85
- II.50 - Particle and Hole Symmetry in Collective Excitation of Medium Nuclei with $Z \approx 50$ - *M. Sakai* 86
- II.51 - Intrashell Quartet States in Light Nuclei - *L. Satpathy, K.W. Schmid and A. Faessler* 87

Noyaux Exotiques Produits par Ions Lourds - Exotic Nuclei Produced by Heavy Ions

a - Noyaux Superlourds - Superheavy Nuclei

- II.52 - Some Control Experiments on Search for Superheavy Elements in Nature - *G.N. Flerov, G.M. Ter-Akopyan, A.G. Popeko, N.K. Skobelev, V.P. Pereligin and O. Otgonsuren* 88
- II.53 - Etude de Noyaux Super-Lourds par la Méthode de Hartree-Fock - *B. Rouben et G. Sawmier* 89
- II.54 - New Island of Toroidal and Bubble Stability - *C.Y. Wong* 90
- II.55 - Recherche de Noyaux Composés "Super-Lourds" par Spectrométrie de Masse en Vol - *P. Colombani, B. Gatty, J.C. Jacmart, M. Lefort, J. Peter, M. Riou, C. Stephan and X. Tarrago* 91

b - Autres Noyaux - Other Nuclei

- II.56 - Réactions par Noyau Composé Induites par des Ions Argon de Grandes Energies sur des Cibles de Sn, Sb, I et Cs - *H. Gawwin, Y. Le Beyec et N.T. Porile* 92
- II.57 - New Osmium Isotopes : ^{170}Os and ^{171}Os - *K.S. Toth and R.L. Hahn* 93
- II.58 - Caractéristiques de Désintégration α des Isotopes Légers de Bismuth, Plomb et Thallium de $A < 195$ - *H. Gawwin, Y. Le Beyec, M. Lefort and N.T. Porile* 94
- II.59 - Alpha-Recoil Spectroscopy of Heavy-Ion Reaction Products - *R.D. Macfarlane, D.F. Torgerson and A. Pape* 95
- II.60 - Compound-Nuclear and Transfer Reactions in ^{12}C Reactions with ^{238}U and ^{239}Pu - *R.L. Hahn, P.F. Dittner, K.S. Toth and O.L. Keller* 96
- II.61 - In-Flight X-Ray Measurements : A Technique for Identification of Recoil Products, e.g. Superheavy Elements - *P. Armbruster, P.H. Mokler and H.J. STEIN* 97
- II.62 - A Time-of-Flight Spectrometer for Heavy Nuclei - *C.K. Gelbke, K.D. Hildenbrand, B. Kohlmeier, W.F.W. Schneider and R. Bock* 98

Etats de Moments Cinétiques Elevés Peuplés par les Réactions par Ions Lourds

High Angular Momentum States Populated by Heavy Ion Reactions

a - Etudes des Noyaux Produits par (HI,xn) - Studies of Nuclei Produced by (HI,xn) Reactions

- II.63 - Nuclear Band Structure in the Vicinity of the Yrast Line - *J. Kruhlindé* 99
- II.64 - Desexcitation des Noyaux Composés Formés lors des Interactions $^{181}\text{Ta} + ^{11,10}\text{B}$ - *H. Delagrangé, F. Hubert et A. Fleury* 100
- II.65 - A Study of the Ground State Rotational Bands of $^{168,170,172}\text{Yb}$ by (HI,xn) Reactions - *J.N. Mo, R. Chapman, G.D. Dracoulis, W. Gelletly and A.J. Hartley* 101
- II.66 - Level Properties in the Even-Even Nuclei $^{130,132,134}\text{Ce}$ - Further Evidence for the Back-Bending Effect - *P. Taras, W. Dehnhardt, S.J. Mills, J. Merdinger, U. Neumann, M. Veggian and B. Povh* 102
- II.67 - Study of High Spin States in ^{104}Pd via the $^{94}\text{Zr}(^{13}\text{C},3n)^{104}\text{Pd}$ Reaction - *S. Cochavi, O. Kistner, M. McKeown and G. Scharff-Goldhaber* 103
- II.68 - Angular Momentum Boundary of the VMI Law - *G. Scharff-Goldhaber* 104

II.69 - The Level Structures of Light Even Strontium Isotopes Produced by $^{70,72,74,76}\text{Ge}(^{12}\text{C},4n)$ Reactions - <i>T. Inamura, Y. Tendow and M. Odera</i>	105
II.70 - Isotopes du Plomb Formés par Réaction (Ions Lourds, xn) - <i>G. Albouy, J.M. Lagrange, M. Pautrat, N. Poffe, C. Roulet, H. Sergolle and J. Vanhorenbeeck</i>	106
II.71 - Etats de Moment Angulaire Elevé dans les Isotopes du Plomb Déficités en Neutrons - <i>G. Albouy, J.M. Lagrange, M. Pautrat, C. Roulet, H. Sergolle et J. Vanhorenbeeck</i>	107
II.72 - Effect of the $N = 108$ "Deformed Shell" on Nuclear Properties - <i>J. Jastrzebski</i>	108
II.73 - Experimental Evidences for Phase Transitions in Atomic Nuclei - <i>A. Johnson, H. Ryde, S.A. Hjorth and D. Barnéoud</i>	109
II.74 - Recoil-Distance Lifetime Measurements of Some High Spin States in ^{35}Cl , ^{38}Ar and ^{39}K - <i>J.C. Merdinger and W. Dehnhardt</i>	110
 <u>b - Etudes Spectroscopiques Diverses - Various Spectroscopic Studies</u>	
II.75 - Excitation of Rotational Bands in ^{24}Mg by 12-Nucleon-Transfer - <i>H.V. Klapdor and H. Reiss</i>	111
II.76 - Equilibrium Quadrupole and Hexadecapole Deformations in Actinide Nuclei - <i>W.T. Milner, F.K. McGowan, C.E. Bemis Jr., J.L.C. Ford Jr., R.L. Robinson and P.H. Stelson</i>	112
II.77 - Heavy Ion Noise - <i>P. Charles, M. Dost, B. Fernandez, J. Gastebois and S.M. Lee</i>	113
II.78 - Configuration Mixing Effects in the Study of Magnetic Moments for Heavy Nuclei - <i>L. Grünbaum and M. Tomaselli</i>	114
 <u>Effets Electroniques de Champs Externes Forts sur les Collisions par Ions Lourds</u> <u>Strong External Electronic Field Effects in Heavy Ion Collisions</u>	
II.79 - Electronic Effects of Strong External Fields in Heavy Ion Collisions - <i>J. Rafelski, B. Müller and W. Greiner</i>	115
II.80 - X-Ray Emission of Highly Stripped Ions - <i>H.D. Betz and H.W. Schnopper</i>	116

Diffusion Quasi-Libre - Quasi-Free Scattering

Corrélations à Double Portée - Short Range Correlations

Dissociation de Noyaux Légers - Fragmentation of Very Light Nuclei

- III.1 - Quasi-Free Scattering to Unbound States - *R. Lipperheide and U. Wille* 119
- III.2 - Short-Range Correlations and Multiple Scattering Effects in Nucleon Emission Induced by High Energy Hadrons - *M. Błeszyński and A. Matecki* 120
- III.3 - Quasi-Free (p,p α) Reactions at 156 MeV on Some Intermediate and Heavy Nuclei - *D. Bachelier, M. Bernas, O.M. Bilaniuk, J.L. Boyard, J.C. Jourdain and P. Radvanyi* 121
- III.4 - Calculations on the ${}^7\text{Li}(p,pt){}^4\text{He}$ Reaction - *A.K. Jain and N. Sarma* 122
- III.5 - (e,e'p) Reactions at 500 MeV - *E. Aurioł, A. Bussiere, J. Dupont, M. Lefevre, G. Lemarchand, J. Millaud, J. Mougey, Phan Xuan Ho, M. Priou, D. Royer and I. Sick* 123
- III.6 - Momentum Distribution of Protons in Calculation Through (e,e'p) Reaction, at 80 MeV Missing Energy - *G. Campos Venuti, G. Capitani, G. Cortellessa, E. De Sanctis, G. Farchi, S. Frullani, R. Giordano, P. Salvadori and K. Takamatsu* 124
- III.7 - Effects of Short Range Correlations and Distortions in Quasi-Elastic Scattering - *H.M. Hofmann* 125
- III.8 - Analysis of (γ ,p) and (e,e'p) Reactions at Intermediate Energies - *W. Weise* 126
- III.9 - Electromagnetic Tests of High Momentum Components in Nuclear Wave Functions - *H. Kümmel* 127
- III.10 - A Three-Nucleon Problem at High Energy : Energy Dependence of Backward p-d Elastic Scattering below 1 GeV - *R. Bouchez and J. Jungerman* 128
- III.11 - Réactions D(p,2p)n et D(p,pn)p à 156 MeV - *J.P. Didelez, I.D. Goldman, E. Hourany, H. Nakamura, F. Reide et T. Yuasa* 129
- III.12 - Coherent Dissociation $P + {}^3\text{He} \rightarrow P + D + P$ at 600 MeV - *J. Gardes, J. Fain, L. Meritet and M. Querrou* 130

Résonances Baryoniques - Baryonic Resonances

Diffusion de Pions - Pion Scattering

Effets de Mésons Virtuels - Virtual Meson Effects

Interactions Faibles - Weak Interactions

- III.13 - Section Efficace de la Réaction ${}^4\text{He}(\gamma, \pi^-)$ au Voisinage de la Résonance $\Delta(1236)$ - *P. Argan, G. Audit, N. de Botton, J.M. Laget, J. Martin, C. Schuhl et G. Tamas* 131
- III.14 - Photoproduction du Méson π^- sur le Deutérium autour de la Première Résonance - *R. Blum, J. Boucrot, B. Grossetete, W. McGill et H. Nguyen Ngoc* 132
- III.15 - Résonance 3-3 dans la Photoproduction ${}^3\text{He}(\gamma, \pi^+){}^3\text{H}$ - *D. Bachelier, M. Bernas, J.L. Boyard, J.C. Jourdain et P. Radvanyi* 133
- III.16 - Photoproduction Cohérente du Méson Neutre π^0 sur le Deutérium au Voisinage de la Première Résonance - *B. Bouquet, J. Buon, B. Grelaud, H. Nguyen Ngoc, P. Petroff, R. Riskalla et R. Tchapoutian* 134

III.17 - Photoproduction of Charged Pions from ^{16}O in the Saxon-Woods Basis - <i>K. Srinivasa Rao</i>	135
III.18 - Elastic Scattering of Negative Pions from ^{16}O in the Region of the (3,3)Resonance - <i>R.W. Beraaw, J.S. Vincent, E.T. Boschitz, M. Blecher, K. Gotow, D.K. Anderson, R. Kerns, R. Minehart, K. Ziock and R. Johnson</i>	136
III.19 - Preliminary Phase Shift Analysis for $\pi^4\text{He}$ Scattering - <i>I.V. Falomkin, M.M. Kulyukin, V.I. Lyashenko, A. Mihul, F. Nichitiu, G.B. Pontecorvo, G. Piragino and Y.A. Sheherbakov</i>	137
III.20 - A Chew-Low Approach to Pion-Nucleus Scattering - <i>C.B. Dover and R.H. Lemmer</i>	138
III.21 - Photodésintégration de l'Hélium-3 dans la Région du $\Delta(1236)$ - <i>P.E. Argan, G. Audit, N. de Botton, J.M. Laget, J. Martin, C. Schuhl et G. Tamas</i>	139
III.22 - Virtual Particle Effects in Deuteron Electromagnetic Structure - <i>M. Chemtob, E.J. Moniz and M. Rho</i>	140
III.23 - Exchange Current Effects in the β -decay $^{42}\text{Sc}(7^+) \rightarrow ^{42}\text{Ca}(6^+)$ - <i>A.M. Green</i>	141
III.24 - π -Nuclear Scattering and Violation of the Chiral Symmetry - <i>M. Ericson and M. Rho</i>	142
III.25 - Isotensor Muon Capture in Nuclei - <i>M.D. Shuster and M. Rho</i>	143
III.26 - The Second Class Current Problem : Role of Meson Exchanges - <i>K. Kubodera, J. Delorme and M. Rho</i>	144

Diffusion de Nucléons et Noyaux Complexes - Scattering of Nucleons and Complex Nuclei

a - Au-dessus de 500 MeV - Above 500 MeV

III.27 - On High-Energy Scattering of Protons by Nuclei - <i>E. Lambert and H. Feshbach</i>	145
III.28 - p - ^3He and p - ^3H Elastic Diffusion at 600 MeV - <i>L. Meritet, J. Fain, J. Gardes, M. Querrou, J.F. Pauty, G. Peynet and F. Vazeille</i>	146
III.29 - Coulomb Nuclear Interference in p - d Elastic Scattering at 600 MeV - <i>B. Jargeaix, A. Lefort, J. Gardes, L. Meritet, J.F. Pauty, M. Querrou, G. Peynet and F. Vazeille</i>	147

b - Au-dessous de 500 MeV - Below 500 MeV

III.30 - Non-Locality of Pauli Correlation Effects in the Medium-Energy Nucleon Optical for ^{12}C and ^{16}O - <i>R.C. Johnson and D.C. Martin</i>	148
III.31 - Sur l'Influence de l'Interaction Spin Orbite à Haute Energie - <i>J. Raynal</i>	149
III.32 - Scattering of 139 MeV Alpha Particles by ^{12}C - <i>G. Tibell, A.A. Cowley, D.A. Goldberg, H.G. Pugh, W. Reichart, S.M. Smith and N.S. Wall</i>	150
III.33 - High-Energy Alpha and Helium Inelastic Scattering - <i>B. Tatischeff, I. Brissaud, Y. Le Bornec and N. Willis</i>	151
III.34 - Exchange Effects in the Elastic Scattering of 140 MeV Alpha Particles by ^3He - <i>H.G. Pugh, P.E. Frisbee and H.D. Holmgren</i>	152
III.35 - Mesure du Terme d'Echange par la Distribution Angulaire Complete de la Diffusion des α de 166 MeV sur le ^6Li - <i>D. Bachelier, M. Bernas, J.L. Boyard, R. Devries, H.L. Harney, J.C. Jourdain, P. Radvanyi et M. Roy-Stephan</i>	153

III.36 - Diffusion Multiple de Protons de 156,5 MeV sur la Masse $A = 3$ - <i>Ph. Narboni</i>	154
III.37 - Three-Body Treatment of the Binding Effects in Multiple Scattering Theory - <i>J. Révai</i>	155
c - <u>Rayons Nucléaires - Nuclear Radii</u>	
III.38 - Nucleon Distributions in Nuclei from High Energy Processes - <i>R.J. Lombard and J.P. Auger</i>	156
III.39 - Total Reaction Cross-Sections for Pions on Nuclei, and Neutron Density Distributions - <i>B.W. Allardyce, C.J. Batty, D.J. Baugh, E. Friedman, G. Heymann, M. Cage, G.J. Pyle, G.T.A. Squier, A.S. Clough, J. Cox, D.F. Jackson, S. Murugesu and V. Rajaratnam</i>	157
III.40 - Determination of Neutron Distribution Radii by Alpha-Particle Elastic Scattering - <i>I. Brissaud, L. Bimbot, Y. Le Bornec and B. Tatischeff</i>	158
<u>Atomes Hadroniques - Hadronic Atoms</u>	
III.41 - New Results from Pionic Atoms - <i>L.Tauscher, G. Backenstoss, I. Bergström, T. Bunaciú, J. Egger, S. Hultberg, R. Hagelberg, H. Koch, H. Povel, R. Price and A. Schwitter</i>	159
III.42 - Strong Interaction Effects in Kaonic Atoms - <i>H. Koch, G. Backenstoss, A. Bamberger, I. Bergström, P. Bounin, T. Bunaciú, J. Egger, S. Hultberg, U. Lynen, H. Ritter and A. Schwitter</i>	160
III.43 - Particle Physics Aspects in Hadronic Atoms - <i>G. Backenstoss, A. Bamberger, I. Bergström, T. Bunaciú, J. Egger, R. Hagelberg, H. Koch, Y. Lynen, H. Ritter, A. Schwitter and L. Tauscher</i>	161
<u>Forces Nucléaires - Nuclear Forces</u>	
III.44 - A Phenomenological Analysis of Proton-Proton Scattering from 50 to 1000 MeV - <i>A. Chastel</i>	162
III.45 - A Relativistic One-Boson-Exchange-Potential and its Relation to the Two-Nucleon Data and the Nuclear Matter Properties - <i>R. Alzetta, K. Bleuler, K. Erkelenz and K. Holinde</i>	163
III.46 - Tests and Extensions of Boson Exchange Potentials - <i>S. Wagner, K. Erkelenz and K. Bleuler</i>	164
III.47 - Bremsstrahlung Proton-Proton à 156 MeV - <i>A. Willis, V. Comparat, R. Frascaria, N. Marty, M. Morlet et N. Willis</i>	165
III.48 - Réaction $D(p,2p)n$ à 155 MeV pour de Grands Transferts de Moment, et Interaction Nucléon-Nucléon hors Couche d'Energie - <i>M. Morlet, R. Frascaria, N. Marty et A. Willis</i>	166
<u>Diffusion d'Electrons et Interactions Electromagnétiques</u>	
<u>Electron Scattering and Electromagnetic Interactions</u>	
III.49 - Etude des Etats Collectifs des Noyaux Pair-Pairs à une Couche Complète par Diffusion d'Electrons - <i>Phan Xuan Ho, J.B. Bellicard, Ph. Leconte et I. Sick</i>	167
III.50 - Spectra of Neutrons Emitted in Muon Capture - <i>L.L. Hill and H. Uberall</i>	168
III.51 - Resonance Effects in Mesic Atoms. Electromagnetic Properties of ^{209}Bi and Tallium Isotopes - <i>M. Tomaselli, D. Herold and L. Grünbaum</i>	169

Noyaux Exotiques Produits par Spallation - Exotic Nuclei

III.52 - Production and Study of Very Neutron Deficient Nuclei - *L. Westgaard and The Isolde Collaboration* 170

III.53 - Production of New-Neutron Rich Light Nuclei in High Energy Reactions - *R. Klapisch, A.M. Poskanzer, R. Prieels, E. Roeckl, C. Rigard and C. Thibault* 171

Divers - Various

III.54 - Etude des Interactions d'Ions ^{16}O de 250 MeV/Nucléon - *R. Kaiser, J.P. Massue, R. Pfohl and R. Schmitt* 172

III.55 - Une Nouvelle Machine pour la Physique Nucléaire à Energie Intermédiaire: le Synchrotron Saturne de 3 GeV - *B. Thevenet et R. Vienet* 173

Post-Deadline (Les Auteurs ne sont pas inclus dans l'Index)

(Authors are not included in the Index)

PDL.1 - Masses of Nuclei far from the Stability Line - *E.R. Hilf* 177

PDL.2 - Plans for a Two-Stage Separator of Unslowed Products of Heavy Ion Reactions - *W. Eichler, H. Ewald, K. Güttner, P. Hinckel, G. Münzenberg, F. Nickel and H. Wollnik* 178

PDL.3 - Large Angle Elastic Scattering of Deuterons from Hydrogen : and the D-State Probability P_d - *G. Igo, J.C. Fong, S.L. Verbeck, M. Goitein, D.L. Hendrie, J.B. Carroll, B. McDonald, A. Stetz, V. Perez-Mendez and M.L. Makino* 179