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MATHEMATICIANS AND COMPUTER SCIENTISTS OF ROMANIAN EXTRACTION
RESIDING OUTSIDE ROMANIA

Florin Constantinescu
Fachbereich Mathematik
Universität Frankfurt
FRANKFURT/Main
West Germany

Mircea Predeleanu
Laboratoire de Mécanique
des Solides
École Polytechnique
PALAISEAU 91128, France

Richard Blum
Department of Mathematics
University of Saskatchewan
SASKATOON, S7N 0W0, Canada

Radu Rosca
Av. Émile Zola 59
Paris 15e
FRANCE

Ioana Cioranescu
Fachbereich 17-Mathematik
Universität Paderborn
4790 PADERBORN
West Germany

Liviu Solomon
Laboratoire de Mécanique Théorique
Université de Poitiers
86022 POITIERS, France

Marian Aron
Department of Mathematics
Plymouth Polytechnic
Drake Circus, PLYMOUTH DEVON
PL4 8AA, Great Britain

Stefan Ralescu
Department Appl. Math.
Brown University
Providence, R. I. 02912

Elemer Rosinger
CSIR-NRIMS
P. O. Box 395
PRETORIA, South Africa

Alex Pelin
Department of Mathematics
Temple University
PHILADELPHIA, Pennsylvania

Laszlo Zsido
Mathematisches Institut A
Universität Stuttgart
7000 STUTTGART 80
West Germany

G. D. Ianculescu
17171 Roscoe Blvd., Apt. 250
NORTHRIDGE, California 91325

Ioan D. Landau
Laboratoire d'Automatique
Institut National Polytechnique
GRENOBLE, France

Harry Cohn
Department of Statistics
University of Melbourne
PARKVILLE, Australia

C. Ionescu-Tulcea
Department of Mathematics
Northwestern University
EVANSTON, Illinois 60201

Radu Theodorescu
Department of Mathematics
University of Laval
QUEBEC, G1K 7P4, Canada

Christina Zamfirescu
Department of Mathematics
Hunter College
695 Park Avenue
NEW YORK, New York

Aristide Deleanu
Department of Mathematics
Syracuse University
SYRACUSE, New York 13210

Andrei Ocneanu
Department of Mathematics
Pennsylvania State University
UNIVERSITY PARK, PA 16892

Corina Reischer
Department of Mathematics
University of Quebec
Trois-Rivieres, C. P. 500
QUEBEC, G9A 5H7, Canada

C. Corduneanu
Department of Mathematics
The University of Texas
at Arlington
ARLINGTON, Texas 76019

Alexandra Bellow
Department of Mathematics
Northwestern University
EVANSTON, Illinois 60201

Alex Suci
Department of Mathematics
Columbia University
NEW YORK, New York

Felix Albrecht
Department of Mathematics
University of Illinois
URBANA, Illinois 61801

Adolph Cusmariu
5248 W. Running Brook
Columbia, MD 21044

Christian Constanda
Department of Mathematics
University of Strathclyde
26 Richmond Street
GLASGOW G1, 1XH, Scotland

Dan Burghilea
Department of Mathematics
Ohio State University
COLUMBUS, Ohio 43210

Vasile-Mihai Popov
Department of Mathematics
University of Florida
GAINESVILLE, Florida 32611

George Lusztig
Department of Mathematics
MIT Room 2-276
Cambridge, Massachusetts 02139

Rodica Socolescu
Mathematisches Institut
Universität
D-75 KARLSRUHE, West Germany

Dana Schlomiuk
Department of Mathematics
University of Montreal
MONTREAL, Quebec, H3C 3J7
Canada

Lawrence Lupash
1401 S. Harbor Blvd.
LA HABRA, California 90631

Dan Jurca
24427 Marie Drive
HAYWARD, California 94542

S. Zaidman
Department of Mathematics
University of Montreal
MONTREAL, QUEBEC
H3C 3J7, Canada

Nicolae Dinculeanu
Department of Mathematics
University of Florida
GAINESVILLE, Florida 32611

Peter Hammer
Combinatorics and Optimization
Department
University of Waterloo
WATERLOO, Ontario, Canada

Dan Socolescu
Mathematisches Institut
Universität
D-75 KARLSRUHE,
West Germany

Norbert Schlomiuk
Department of Mathematics
University of Montreal
MONTREAL, Quebec, H3C 3J7
Canada'

Nicolae Teleman
Department of Mathematics
SUNY at Stony Brook
Stony Brook, New York 11794

Tudor Ionescu
17 Oak Ridge Road
SUDBURY, Massachusetts 01776

M. Rosenblatt-Roth
Department of Mathematics
California State University
FULLERTON, CA. 92634

Dorin Ciomasu & Nina C.
GARTENSTRASSE 2
7332 EISLINGEN-FILS
West Germany

Dorin Ghisa
Département de Mathématique
Université de Moncton
MONCTON, N. B.
Canada E1A 3E9

Tudor Zamfirescu
Abteilung Mathematik
Universität Dortmund
DORTMUND, West Germany

Alexandru Solian
 Department of Mathematics
 University of North Carolina
 CHARLOTTE, North Carolina 28223

Imre Toth
 Lehrstuhl für Allgemeine
 Wissenschaftsgesichte
 8301 Niederleierndorf
 Universität Regensburg
 REGENSBURG, West Germany

Wexler-Kreindler Elena
 Mathématiques
 Université P. et M. Curie
 4 Place Jussieu
 75320 PARIS Cedex 05
 France

M. J. Munteanu (Mrs. Reiman)
 6009 Bradley Blvd.
 BETHESDA, MD 20034

Andrei Duma
 Fachbereich Mathematik u.
 Informatik
 5800 HAGEN
 West Germany

Charles M. Oprian
 Department of Mathematics
 Western Illinois University
 MACOMB, Illinois 61455

Aurel Cornea
 Fachbereich Mathematik
 Katholische Universität Eichstätt
 EICHSTÄTT 8078 West Germany

Anca Barsanescu
 26 rue Miollis
 PARIS 15^e
 France

Sabetai Unguru
 Institute for History &
 Philosophy of Science
 Tel Aviv University
 Ramat Aviv, TEL AVIV 69978
 Israel

Ana Burghilea
 Department of Mathematics
 Ohio State University
 COLUMBUS, Ohio 43210

Hari Bercovici
 Department of Mathematics
 MIT
 Cambridge, Massachusetts 02139

Mihail S. Romanos
 Department of Mathematics
 Cornell University
 ITHACA, New York 14853

Emil Grosswald
 Department of Mathematics
 Temple University
 PHILADELPHIA, PA 19122

Florian Tent
 5041 N. Damen
 CHICAGO, Illinois 60625

Ileana Gorun (Mrs. Bercovici)
 Department of Computer &
 Communication Sciences
 University of Michigan
 ANN ARBOR, Michigan 48109

Lior Tzafriri
 Department of Mathematics
 Hebrew University
 JERUSALEM, Israel

George Isac
Département de Mathématiques
Collège Militaire Royal
SAINT-JEAN, Quebec JOJ 1R0
Canada

Monique Pavel
145 Avenue de Malakoff
PARIS, 75116, France

Emeric Deutsch
Department of Mathematics
Polytechnic Institute of
New York
BROOKLYN, New York

H. Moscovici
Department of Mathematics
Ohio State University
COLUMBUS, Ohio 43210

C. Unguriano
722 Newton Avenue N.
MINNEAPOLIS , MN 55411

Phil Obreanu
Department of Mathematics
Queen's University
KINGSTON, Ontario
Canada

Eugen Radu
Département de Mathématiques
École Normale Supérieure
BP 5118
RABAT, Morocco

Dan Ralescu
Department of Mathematics
University of Cincinnati
CINCINNATI, Ohio 45267

Alexandru Radu
Ponte de St. Julien 8
1227 CAROUGE
Switzerland

Radu Diaconescu
Department of Mathematics
Baruch College (CUNY)
17 Lexington Avenue
NEW YORK , N.Y. 10010

Dan A. Simovici
Department of Mathematics
University of Massachusetts
BOSTON , MASS. 02125

Irinel Dragan
Department of Mathematics
University of Texas
Arlington, Texas 76019

Sofia Dediu
1480 Rockway Avenue
LAKEWOOD, Ohio 44107

Mihai Dediu
14521 Madison Avenue
LAKEWOOD, Ohio 44107

Malvina Baica
Department of Mathematics
Marshall University
HUNTINGTON, West Virginia 25701

Adriana Nastase
Lehrgebeit Aerodynamik des Fluges
TH-Vermittlung 801
Templergraben 55
5100 AACHEN
West Germany

Ivan Erdelyi
Department of Mathematics
Temple University
PHILADELPHIA, Pennsylvania 19112

Marius Stoka
Istituto Matematico
Università Degli Studi
TORINO, Italy

Gregory Constantine
Department of Mathematics
Indiana University
Bloomington, Indiana 47405

Sergiu Klainerman
Courant Institute of Mathe-
tical Sciences
251 Mercer Street
NEW YORK, New York 10012

Alexandru Lascu
Istituto Matematico
Università di Ferrara
FERRARA, Italy

Doina Cioranescu
Laboratoire d'Analyse numerique
Universite de Paris VI
4 , Place Jussieu
75230 PARIS Cedex 05

M. Epstein
Department of Applied
Mathematics
University of Tel Aviv
RAMAT AVIV, Israel

Israel Berstein
Department of Mathematics
Cornell University
ITHACA, New York 14853

Serge Vasilach
4 , Allee du Suret
LE VAUDREUIL
27100 France

I. Vaisman
Department of Mathematics
University of Haifa
Mt. Carmel, HAIFA (31999)
Israel

Theodor Hangan
Université des Sciences et
Technique de Lille
Dept. de Mathématiques B. P. 36
F. 59.650 VILLENEUVE,
France

V. Istratescu
Westring 331
2300 KIEL
West Germany

Dinu Wexler
Institut de Mathématiques
Facultés Universitaires
Rue Bruxelles 61
500 NAMUR, Belgium

I. J. Schoenberg
1111 Oak Way
MADISON, Wisconsin 53705

Constantin Negoita
 Department of Computer Sciences
 Hunter College (CUNY)
 695 Park Avenue
 NEW YORK , New York 10021

Mihaela Antonescu
 Departement d'Informatique
 Universite de Moncton
 MONCTON , N.B.
 E1A 3E9 , Canada

Dan Radulescu
 16724 Yukon Avenue # 2
 TORRANCE , CA 90504

John J. Rau
 6432 Via Estrada
 ANAHEIM , CA 92807

Dan Pascali
 Center for Nonlinear Studies
 Los Alamos National Laboratories
 LOS ALAMOS , N. M. 87545

Casius Alexandru
 Vinetaplatz 2
 1000 BERLIN 65
 West Germany

Nicolae Anghel
 Department of Mathematics
 Ohio State University
 COLUMBUS , Ohio 43210

Marica Lewin
 Mercaz Klitah Carmiel # 506
 20100 CARMIEL , Israel

Ion Marin Belcea
 129 Pemberton Ave
 OCEANPORT , N.J. 07757

Vasile Badea
 596 , rue Lavoie
 STE. DOROTHEE , Laval , P.Q.
 H7X 2P4 , Canada

Elena Eftimiu
 Department of Mathematics
 University of Missouri
 8001 Nat. Bridge
 ST. LOUIS , Missouri 63121

Costin Ghibu
 6225 Bienville
 BROSSARD , Quebec
 J4Z 1W9 , Canada

Nicolae Tutos
 1034 Franklin Road
 MARIETTA , GA 30067

Ilie Popescu
 Departement d'Informatique
 Universite de Quebec a Hull
 HULL , P. Q.
 J8X 3X7 , Canada

Sorana Froda
 Departement de Mathematique
 et Statistique
 Universite de Montreal
 MONTREAL , P. Q.
 H3C 3J7 , Canada

Petru Papadopol
 2A Fuller Terrace
 ALBANY , New York 12205

Anca Deliu Stanescu
 Department of Mathematics
 Washington University
 P.O.Box 1146
 ST. LOUIS , MO 63130

Constantin Ionescu
 477 West 132 Street # 26
 HOWTHORNE , CA 90505

Flavian Abramovici
 Department of Mathematics
 Tel-Aviv University
 RAMAT-AVIV , Israel

Daniel F. Spulber
Department of Economics
Brown University
PROVIDENCE, Rhode Island

Constantin Apostol
Department of Mathematics
Arizona State University
TEMPLE, Arizona 85287

Florian Potra
Department of Mathematics
University of Iowa
IOWA CITY
Iowa 52242

Petre Tautu (M. D.)
Sonderforschungsbereich
Stoachastische Modelle
Im Neuenheimer Feld 294
6900 HEIDELBERG
West Germany

Carmen Vlad
Department of Mathematics
New York Polytechnic Institute
BROOKLYN, New York 11201

Petre Constantin
Department of Mathematics
Indiana University
BLOOMINGTON , IN 47405

Anca Luminita Ralescu
Department of Mathematics
Indiana University
Bloomington, Indiana 47405

Andrei Verona
Department of Mathematics
Ohio State University
COLUMBUS, Ohio 43210

Adolph Pollinger
Israel Institute of Technology
HAIFA, Israel

Nicolae Tipei
1403 East 5th Street
ROYAL OAK , MI 48067

Corneliu Constantinescu
Mathematisches Seminar
ETH-Zentrum
8092 ZURICH, Switzerland

Ioana Hartoceanu
Wilhelm-Busch-Str. 53
6000 FRANKFURT/MAIN 50
West Germany

Egon Balas
Graduate School of Ind. Adm.
Carnegie-Mellon University
PITTSBURGH, PA 15213

Virgil Gligor
Center for Information Sci. Research
University of Maryland
College Park, MD 20742

Tudor Ratiu
Department of Mathematics
University of Arizona
Tucson, AR 85721

Gruia Catalin Roman
Department of Computer Science
Washington University
ST. LOUIS, Missouri 63130

Catalin Pora
407 N. Pennsylvania #604
INDIANAPOLIS, IN 46204

Nicholas Georgescu Roegen
2614 Hemingway Drive
NASHVILLE, TN 37234

Constantin Ivan
Fachbereich 11
Gesamthochschule Duisburg
4100 DUISBURG
West Germany

Marian Apostolache
10 Pinecrest Dr. #3
KITCHENER Ontario
N2A 2G6 Canada

Monica Nicolau
Department of Mathematics
Rutgers University
New Brunswick, NJ 08903

Peter Farkas
Department of Mathematics
Pennsylvania State University
University Park, PA 16802

Andrei Iacob
Weizmann Institute of Science
REHOVOT, Israel

Nicholas Rau
Department of Economics
University College
LONDON WC1E 6BT
England

Adrian Rezus
Department of Computer Science
Katholieke Universiteit
6525 NIJMEGEN
The Netherlands

Vlad Sergiescu
U. E. R. de Mathématiques
Université des Sciences et
Techniques de Lille-I
59655 VILLENEUVE-d'Ascq
France

Silviu Guiasu
Department of Mathematics
York University
DOWNSVIEW, Ontario
Canada M3J 1P3

Ciprian Foias
Department of Mathematics
Indiana University
BLOOMINGTON, Indiana

David Mendel
Scientific Department
Ministry of Defence
P. O. Box 2250 (Dept.44)
HAIFA 31021 Israel

Otto Liess
Fachbereich Mathematik
Technische Hochschule Darmstadt
61 DARMSTADT
West Germany

Monica M. Neagoy
7106 Arran Pl.
BETHESDA, MD 20034

Eug. Nic. Vasilescu
Department of Statistics
Baruch College
46 East 26th Street
NEW YORK, New York 10010

Victor Trutzer
Department of Mathematics
West Virginia University
MORGANTOWN , W. Va. 26506

Stefan Nuța
CAP-Sogeti Tertiaire
26 , rue de la Pepiniere
75008 PARIS , France

Liana Popescu
Institut Univ. de Technologie
Departement de Genie Electrique
Universite de Poitiers
86034 POITIERS , France

Sandu Răutu
Ben Gurion University
of the Negev
84105 BEER SHEVA , Israel

Aldo Lazar
School of Mathematical Sciences
Tel-Aviv University
69978 TEL-AVIV , Israel

Matei Machedon
Department of Mathematics
Princeton University
PRINCETOWN , N.J. 08540

Ion Rațiu
347 South Road #G1
POUGHKEEPSIE , N.Y. 12601

Ion Paraschivoiu
Chercheur a l'Institut de recherche
d'Hydro-Quebec
1800 , Montee Ste-Julie
VARENNES , P. Q.
JOL 2P0 , Canada

Ioana Triandaf
Department of Mathematics
University of Minnesota
MINNEAPOLIS , Minnesota 55455

Sorin Istrail
Department of Mathematics
Wesleyan University
MIDDLETOWN , CT 06457

Radu Popescu
Departement de Mathematiques
Universite de Tours
37200 TOURS , France

Liviu Librescu
Tel-Aviv University
Department of Solid Mechanics
School of Engineering
69978 TEL-AVIV , Israel

Mircea Arcan
Tel-Aviv University
School of Engineering
69978 TEL-AVIV , Israel

Valerian Nita
28857 James'
WARREN , MI 48092

Florin Avram
White Hall
Cornell University
ITHACA , New York 14853

Florin R. David
Department of Mathematics
Courant Institute
251 Mercer Street
NEW YORK , New York 10012

Michael Ghil
Courant Institute NYU
251 Mercer Street
NEW YORK , N. Y. 10012

Fabian Todor
Departement de Mathematique
et Statistique
Universite de Montreal
5620 , rue Darlington
H3C 3J7 MONTREAL , Canada

Ion Filloti
INRIA , B. P. 105
78150 ROCQUENCOURT , France

Ion Moga & Sigrid Moga
Salzburgerstrasse 3/29
8225 TRAUNREUT , West Germany

J. Schönheim
Department of Mathematics
Tel-Aviv University
69978 TEL AVIV , Israel

Costel Peligrad & Magda Peligrad
Department of Mathematics
University of Cincinnati
CINCINNATI , Ohio

Sergiu Hart
Statistics Department
School of Mathematical Sciences
Tel-Aviv University
69978 TEL-AVIV , Israel

Nicolas Radulesco
Le Victoria
13 Blvd Princesse Charlotte
MONTE CARLO , Monaco

Petrişor Mazilu & Magda Mazilu
Hustadtring 61
4630 BOCHUM , West Germany

For the following colleagues , we do not have the exact address :

U S A : M. Breban ; Larisa Patraşcu ; Alexandru Stanculescu ; Marcel Nicolau ;

Ion Fagaraşan ; Carina Parvulescu ; Deonisie Trifan

FRANCE : L. J. Nicolescu ; Carmen Ieşan-Maftei (Paris)

WEST GERMANY : Ştefan Şandor

ISRAEL : Enric Goldhagen ; Sender Solomon ; Pia Horowitz ; Jack Weinstein ;

Andrei Ney ; Dan Butnariu

BELGIUM : Radu Badesco

Editor's Note : The above list has been compiled by using information contained in various directories , membership lists , in mathematical or related publications which specify the affiliation of the authors . A good deal of information reached us through some of our colleagues . We are particularly indebted for assistance to Corneliu Constantinescu , Dan Pascali , Liviu Solomon , Aldo Lazar , and Izu Vaisman .

In order to keep-up with further changes in addresses , and addition of new names , we kindly ask the cooperation of our colleagues .

PHYSICISTS OF ROMANIAN EXTRACTION RESIDING

Pavel Pechiu
6300-D , Joaquin Murieta Av.
NEWARK , CA 94560

Doina Bunaciu-Filip
19 av. Feuillasse 1217
Meyrin - GENEVE
Switzerland

Alexandru Blumen
Lehrstuhl Chemie
Technische Universität
MÜNCHEN W.Germany

Dan Cacuci
Oak Ridge National Labs
OAK RIDGE TN 37830

Radu Balescu
Université Libre de Bruxelles
BRUXELLES Belgium

Ion Ghika
29 rue du Chemin Vert
PARIS France

Constantin Pomponiu
28 East Lance Leaf Rd
The WOODLANDS TX 77380

Vladimir Protopopescu
Department of Chemistry
Boston University
BOSTON , MA 02215

Basarab Nicolescu
Institut de Physique Nucléaire
Universite de Paris - Sud
ORSAY France

Viorel Sergiescu
11 rue de Chatenay 49
92160 ANTONY France

Alexandru Pop
9171 Imperial Avenue
GARDEN GROVE CA 92644

Corneliu Eftimiu
McDonnell - Douglass
P. O. B. 516
ST. LOUIS MO 63166

Mircea Sabău
Argonne National Laboratory
WOODRIDGE IL

Teodor Rosescu
Osterreich Umwelt Institut
WIEN Austria

Meinhard Meyer
Department of Physics
University of California
IRVINE CA 92717

Dan Botez
RCA Laboratories
PRINCETON NJ

Floarea Stancu
Institut de Physique B5
LIEGE Belgium

Mihai Gavrilă
Inst. Atomenmolekulfysik (FOM)
AMSTERDAM The Netherlands

N.Andrei
Department of Physics NYU
NEW YORK N.Y. 10003

Octavian Enea
Laboratoire de Chimie
du CNRS
Universite de Poitiers
POITIERS , France

Mircea Fotino
Department of Physics
University of Colorado
BOULDER , Colorado 80302

Hans Raszillier
Inst. Theor. Physik
Universität Bonn
BONN , West Germany

Mihaela Sararu
Inst. Theor. Kernphysik
KARLSRUHE , West Germany

Sorin Marculescu
Inst. Theor. Kernphysik
KARLSRUHE
West Germany

Ion S. Stefanescu
Inst. Theor. Kernphysik
KARLSRUHE
West Germany

Mihai Rosenberg
Drosselweg no. 12
D-4630 BOCHUM 1
West Germany

Adrian Gelberg
Wüllner Strasse no. 125
D-5000 KOLN 41
West Germany

Vladimir Rittemberg
Inst. Theor. Physik
Universität Bonn
BONN , West Germany

The exact addresses of the following colleagues are not available to us :

WEST GERMANY : Dan Constantinescu (München) ; Mihai Sostarich (Bochum) ;
Mihai Stihl (München) ; Toma Vescan ; Ladislau Banyai ; Nico-
lae Marinescu ; Richard Weiner ; Tudor Dumitrescu

U S A : Adrian Patrascioiu (Arizona) ; Anton Moldovan (Princeton) ; Irina
Russu (Pittsburgh,PA) ; Erwin Friedlander ; Irina Marinescu-
Curelaru ; Calin Popescu ; Stefan Vaida ; Persi Tehric ; Miron
Kaufmann ; Petre Rusu ; Eugen Badralexe

FRANCE : Sorin Ciulli (Montpellier) ; Ileana Milcu-Agalidis (Fontenay aux
Roses) ; Horia Dumitrescu ; Nicolae Carjan ; Iuliu Ushersohn ;

AUSTRALIA : Dumitru Moisescu ; Gabriela Moisescu

SWITZERLAND : Tudor Bunaciu BELGIUM : Alexandru Babenco

ISRAEL : Isac Goldhirsch (Tel Aviv) ; Adina Koch (Jerusalem)

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for their assistance in compiling the list above .

In Memoriam

FROIM (EFRAIM) MARCUS : 1904 - 1983

F. Marcus was born on September 8 , 1904 , in Bucecea , the district of Botoşani , Romania . He went to high school in Botoşani (Liceul "August Treboniu Laurian") and Dorohoi (Liceul "Grigore Ghica Voda") , obtaining his Diploma in 1924 . From 1924 until 1930 , F. Marcus is a student at the famous Politecnico di Torino in Italy . He obtained his doctoral degree in Engineering in 1929 , and in order to comply with the Italian law at that time , he went in 1930 to the Politecnico di Milano where he passed the State Examination .

After his return to Romania , F. Marcus held various engineering jobs in private companies (mainly , building companies) , until 1940 , when the racial laws prohibit him of detaining a job . This situation lasted until 1944 , when Marcus regains a job , and shortly becomes the Head of the Engineering Division of the Botoşani district . In 1953 , as a result of his continuous activity in mathematical research , F. Marcus is appointed an Associate Professor with the Department of Mathematics at the Polytechnic Institute of Iaşi . He held that position for almost 20 years . After he retired from the Polytechnic Institute of Iaşi , in 1970 , F. Marcus emigrated to Israel . He continued his teaching and research activities in Israel , where he was associated for a period of 10 years with the Haifa Technion .

During his studies at the Politecnico di Torino , F. Marcus had as a Professor of Mathematics the famous Guido Fubini . At that time , Fubini was very active in Differential Geometry , and recognizing in Marcus a true gifted student , he encouraged him toward the research activities in this field . Marcus was really fascinated by Fubini's personality , and he kept for his Professor an admiration that did not fade during his entire life . Of course , Marcus agreed to get involved in mathematical research , and continued reading Fubini-Čech treatise on Projective Differential Geometry as a young engineer on various as-

signments in the industry .

The research activity Marcus has deployed for almost half a century was exclusively directed toward problems in classical Differential Geometry , with special regard to the theory of surfaces in the projective space , and the theory of networks and congruences .

One of the most interesting results obtained by Marcus is contained in the paper "On Bianchi's permutability theorem" , published in Annals of Mathematics , 1948 . Fubini has made an attempt to obtain a converse theorem to the important Bianchi's permutability theorem , but his solution was not complete . Using some ideas of Elie Cartan , Marcus has succeeded to present a complete and elegant solution to this problem .

Marcus has produced more than 100 papers in the field of Differential Geometry , and without trying to give a complete account on his work , we want to take the opportunity listing some of the topics in which he has been involved , and brought significant contributions . A series of papers published by Marcus dealt with line congruences , and most classical results due to Darboux , Tzitzeica and Finikov have been improved and generalized . Among other results , he has proven that the normal lines to a minimal surface have as a focal surface another minimal surface . Marcus has been also repeatedly concerned with the so-called Ionas surfaces . He has proven that there exist nonruled Ionas surfaces , on which Koenigs' type networks do exist . Marcus has been inspired in his research topics by Fubini , Čech , Terracini , Godeaux , Tzitzeica , Mayer , and by many others . His research drew attention from the part of several researchers in the field of projective differential geometry , who have used Marcus' results and praised him for his achievements . Several results Marcus has obtained have been quoted in the book written by Gerit Bol on Projective Differential Geometry . In a joint paper with Octav Mayer , starting from certain results Marcus obtained earlier , they have studied the projective similarities and the class of surfaces with a continuous group of conformal projective transformations .

After almost two decades spent as a faculty member with the Department of Mathematics at the Polytechnic Institute in Iași , when his list of publications was nearing 100 items , Marcus has been awarded a Ph D degree in Mathematics by the University of Iași .

Marcus has been a person with a special sense of humor . He was a friendly character , a gregarious one . He liked very much playing chess and entertaining colleagues with his recollection from his Italian period .

LIST OF PUBLICATIONS

1. Interpretazione geometrica dell'equazione $\partial^2 \log(\beta\gamma) / \partial u \partial v + \beta\gamma = 0$, e qualche proprieta delle congruenze di rete del fascio canonico . Atti Accad. Naz. dei Lincei (Roma) , VI (1938) , 145-148 .
2. Sur une correspondance remarquable entre droites et cubiques et une propriete d'une classe de surfaces isothermes asymptotiques de Fubini . Comptes Rendus (Doklady) Acad.Sci.URSS , 32(1944) , 242-244 .
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Editor's Note . We are indebted to Professor Izu Vaisman for providing the material necessary to compile the article on Marcus' life and work .

A Viewpoint

In the July 1983 issue of the journal KYBERNETES , Professor A. M. Andrew has published a review of the book "Realms of the Unconscious : The Enchanted Frontier" by V.V.Nalimov . Andrew confesses that "this is not an easy book to get to grips with" , and that he is "mistified by much of it" because of "semantic difficulty" , and that "despite of all this , it is impossible not to be impressed by this book" .

I quite agree with Andrew . This is a remarkable book , and , therefore , it deserves a little bit of attention . In what follows , I am trying to explain how we can bypass the semantic difficulty , why Nalimov's point of view seems to be important for modern Cybernetics , and not only for Cybernetics , and how his work seems to open a new perspective in the methodology of science .

In order to achieve this , the book has to be put into relation with a previous one authored by Nalimov , entitled "Faces of Science" , and published by the same ISI Press , Philadelphia , 1981 .

Nalimov is interested in modelling , and the power of Mathematics seen as a tool , or as a language of modelling . The idea of a model is central in System Theory , and any attempt toward a systematic approach depends on the language used for modelling . This fact is well illustrated in Physics .

Why the universe is the way it is , occupies the best minds of the human race for a long time . It always has . Among the questions about the nature of our universe is why is it made only of matter , instead of both matter and antimatter . A positron encounters an electron , and the two disappear through annihilation . In specialized laboratories , equal amounts of matter and antimatter are routinely produced on the microscopic level. Why , then , is the large-scale world made up of matter alone ? Because the antimatter might have decayed asymmetrically , answer the physicists , developing the grand unification theory .

Assuming these theories are accepted , a much more profound mystery will stand to be tackled : why there was a Big Bang at all ? Using the same theories , say the physicists , it might be possible to calculate the amount of energy in

a state of "nothing" , a state we can imagine as a vacuum with absolutely no matter present . It is as well possible to calculate the energy associated with "something" , a universe with matter present . If these calculations reveal the fact that there is less energy in a state of 'something' than in a state of "nothing" , then we will know that the vacuum can spontaneously produce matter , because natural systems always move toward the state of lowest possible energy . The answer to the ancient question "Why is there something , rather than nothing" could be that "nothing" is unstable .

Physics has acknowledged the legitimacy of a reality which cannot be registered by physical devices , and has come close to the concept of unobservable state . Physics , in the course of its development , says Nalimov , has taught us in the long run how to explain the incomprehensible comprehensibly , by the much more incomprehensible . This is exactly what he attempts to do in his book . He tries to explain why the complexity of scientific descriptions can be reduced if we adopt the language of the modern theory of possibilities . In this way , we are prepared to see the world through the triad : Nothing , Something , Potentiality .

Ontologically , the only thing we can state is that the potentiality of the physical world , no matter how it is expressed , in laws or constants , or in the probabilistically given "tendency to occur" , should be thought of as an independently given essence . The ontology of the world would be incomplete if we do not consider the nonobservable . The observable is given to us through Time , and the passage from observable to nonobservable can be comprehended only through the comprehension of Time .

In the language of the theory of possibilities , we say that a linguistic variable is known , if its evaluation function is known . This is to say that we may be satisfied with a purely behavioral description of the phenomena . For instance , in everyday life we often deal with imprecisely defined properties or quantities , like "a few men" , " a young man" , "a tall girl" . In the mid 60's, the notion of a fuzzy set was introduced in order to allow such concepts to be formulated and manipulated . The literature on fuzzy sets has grown rapidly , amounting by now at over 4,000 papers , textbooks , and monographs .

The key idea in fuzzy set theory is that an element has a degree of membership in a fuzzy set . We usually assume that this degree is a real number in the interval from 0 to 1 . In the case of the fuzzy set of tall girls , the elements are girls and their degree of membership depends on their heights . For example,

a girl who is 5 feet tall might have degree 0 , a girl who is 6 feet tall might have degree 1 , while girls of intermediate heights have intermediate degrees . As a matter of fact , a fuzzy set is a function relating observed elements with subjective evaluations based on the order structure of the unit interval . These are beliefs coming from our unconscious . The world not measured is perceived .

For a long time , science acknowledged the validity of studying nature by means of physical devices which are created by man , but it did not recognize man as such a device . The theory of fuzzy systems means a new step in the methodology of science : measurements from physical devices are combined with subjective evaluations , and used together to defuzzify compact representations in natural language . Vagueness implies time-invariance , that is - structural stability . Fuzzyness came into the world through man , who is able to enlarge through abstraction the space of his conscious , and thus to eliminate the need for a parameter like Time .

The discrete and the continuous , according to this point of view , are not different sources of psychic existence , but only different manifestations of it . In other words , a person proves to be one of the possible states of a semantic field . This idea is at the core of the so-called cybernetics of the human system governed by a pullback in the order structure of all possible evaluations . Geyer and Zouwen in Dependence & Inequality , discussing a system approach to the problems of developing countries , devoted a chapter to this topic .

Nalimov makes a step forward . He investigates the ability for humans to interact with the semantic vacuum , viewed as a specific state of the semantic universe . In the chapter entitled "How can we contact semantic nothing" , he is investigating the stopping of the psychological Time . Looking deeply into the work of the schools associated with the names of Freud , Jung , James , and Piaget , he formulated a new set of questions pertaining to what we mean by such common terms as imagination , memory , creativity , time and wholeness . By deepening and extending the concepts of Time which have evolved from Plotinus , Leibnitz , Kant , and Einstein , Nalimov poses the question : Do human posses a common unconsciousness ? And further , would not such an assumption clarify similar experiences across both temporal and cultural boundaries ? The reader may be particularly fascinated by the novel experiments in altered states of consciousness , reported in the second book .

Nalimov is a mathematician . Co-worker of the world-renowned Andrei Kolmogorov , he notices that the commonly accepted axiomatics of probability theory ,

proposed by Kolmogorov , lacks the notion of chance . More than once he drew the readers's attention to the fact that the notion of chance is of an epistemological nature . Possibilities are not probabilities . If we wish , we can relate membership to subjective probability ; for example , we can say that a girl's degree of membership in the set of tall girls is equal to the probability that an observer would classify her as tall . However , we do not have to do this ; we can simply take the degree of membership as a primitive concept . Randomness is one thing , and fuzzyness is another .

In the tradition of the early natural philosophers , Nalimov speaks in support of all those advocating that the unconscious is a specific receptor which opens up a contact with what we call reality . It is , certainly , something to think about .

Nalimov's book is particularly valuable today , when cyberneticians are investigating transmitted information , versus created information . This trend is exemplified by Bruce England who , in discussing a new model for cyberneticians (Kybernetes , No. 12 , 1983 , 43-48) , considers that cybernetic theory should integrate the duality experience with the experience of unity .

Awareness in differentiating between conceptual and existential approaches to knowledge has characterized Philosophy for a period of time . In a recent book , Professor Nechita Staniloae from Romania , discussing "Orthodox Spirituality" , offers at the same time a rich survey of the possibilities to explore the unconscious , which can seriously improve the bibliography presented by Professor Andrew in his review . In a presentation of Staniloae's book , to appear soon in the journal Human Systems Management , I am pointing out that this awareness is fully illustrated also by modern ontology , from Heidegger to Noica (Kybernetes , No. 11 , 1982 , 147-148) .

In this way , one can easily understand Nalimov's claim that he heralds a "second Mediteranean" - a change in our intellectual environment .

Constantin V. Negoita
City University of New York
695 Park Avenue
New York , N. Y. 10021

1984 A.R.A. CONVENTION

From May 4 - 6 , 1984 , Brown University (Providence,R.I.) hosted the IX-th Annual Convention of the American Romanian Academy of Arts and Sciences . The President of A.R.A. , Professor Maria Manoliu-Manea , together with the local organizer Professor Sanda Golopentia-Eretescu , assisted by the members of the local organizing committee (Professor Henry F.Majewski , Brown University ; Professor Paul Quinlan , Rhode Island Junior College in Providence ; Professor Kenneth Rogers , University of Rhode Island in Kingston , R.I.) , have succeeded in the difficult task of presenting an outstanding program for this convention , and harmoniously orchestrating the interests and preferences of more than one hundred participants from the following countries : France , Switzerland , Great Britain , West Germany , Denmark , Belgium , Australia , Canada , Mexico , and the United States of America .

During the convention , there have been more than twenty sessions dedicated to the following fields of research : History , Folklore , Literature , Linguistics , Political Sciences , Philosophy , Poetry , and Mathematics (two sessions) . Special sessions have been dedicated to the work of Emile Cioran , Mircea Eliade , and Stephane Lupasco . Also , special sessions dealt with the Arts (Romanian Folk Dances , Recital from the music by George Enesco and Bela Bartok , Romanian singers in America , the History of Art) .

This Annual Convention was by far the most impressive in regard to the number of participants , the geographical areas they represented , and the variety of topics discussed in the sessions .

The general theme of the convention was "Romanian Intellectuals in Contemporary Western Culture" . But as usual , participants were free to choose the topic of their preference .

For the first time since the foundation of the American Romanian Academy of Arts and Sciences , the program of the present convention included sessions entirely dedicated to Mathematics .

The Mathematical Sessions have been scheduled on Saturday , May 5 , and have been chaired by Professor Jack K.Hale from the Lefschetz Center for Dynamical Systems at Brown University , and by Professor Emilio O. Roxin from the University of Rhode Island . The papers presented at these two sessions by mathematicians of Romanian extraction residing in Canada or in the United States of America have been grouped as follows :

SESSION MATHEMATICS I

1. Ilie Popescu (Université du Quebec à Hull) : La fonction perturbatrice d'un système canonique d'équations différentielles
2. Constantin Corduneanu (University of Texas at Arlington) : Almost-periodic differential systems
3. Samuel Zaidman (Université de Montréal) : Periodic solutions of abstract differential equations with periodic right hand side
4. Dorin Ghişa (Université de Moncton) : Some applications of deterministic and stochastic calculus to life sciences
5. Virgil Gligor (University of Maryland , College Park) : Non-approximable NP-complete problems

SESSION MATHEMATICS II

1. Dan Simovici and Dan Ştefanescu (University of Massachusetts , Boston) : Galois connections and their applications in Computer Sciences
2. Emilio O. Roxin (University of Rhode Island) : The reachable sets in the theory of optimal control
3. Ion Ratiu (IBM Corporation) : M-sequences and their applications to the testing of large digital networks
4. Dan Botez (RCA Laboratories , Princeton , N.J.) : Semiconductors lasers: Coherent light from minuscule solid-state devices

The audience consisted mainly of A.R.A. members : Dr. Mircea Fotino (University of Colorado at Boulder) , Dr. Vladimir Protopopescu (Boston University) , Dr. George Făgăraşanu (St. Gallen , Switzerland) , Mr. Aurel Buliga (New York) , Mr. Ion Cepoi (Los Angeles) , Mr. Mircea Ionniţiu (California) . We take the opportunity to mention the participation of Dr. Barbara Kaskosz , Mathematical Institute of the Polish Academy of Sciences in Warsaw (Visiting with the University of Rhode Island) , and Mrs. (Earl) Pope from Easton , PA .

The initial program of the convention included also the following mathematical papers :

Irinel Dragan (University of Texas at Arlington) : A greedy algorithm for solving some multi-objective discrete programming problems

George Isac (Collège Militaire Royal , Saint Jean , Canada) : Positive eigenvalues and the complementarity problem

Since last moment circumstances prevented both our colleagues to take part to the convention , we asked them to submit abstracts of their projected papers . They graciously complied with our request , and the abstracts are reproduced below .

A B S T R A C T S

Dan Botez : Semiconductors lasers : Coherent light from minuscule solid - state devices

The paper starts with the presentation of basic operational principles of lasers in general , and semiconductor lasers in particular . First , low-power (3-5 mw) diode lasers and their applications are described and discussed . Then , major types of high-power (15-50 mw) devices and their potential applications are considered . Emphasis is placed on the most powerful device to date : the CDH-LOC laser , an RCA invention and commercial product .

Constantin Corduneanu : Almost periodic differential systems

The paper is devoted to the problem of almost periodicity of bounded (on the real axis) solutions of ordinary differential systems of equations , which in vector form can be written as $\dot{x}(t) = f(t, x(t))$, or $x''(t) = f(t, x(t))$. It is assumed that the right hand side $f(t, x)$ is an almost periodic function in t , depending of the "parameter" x . The almost periodicity does not have to be necessarily the classical Bohr's almost periodicity for $f(t, x)$, but it is always meant in that sense for the solution whose boundedness is assumed . The basic tool is the Liapunov technique to use auxiliary functions that verify certain inequalities . The basic difference with respect to earlier results in this field is the fact that the differential inequalities obtained for Liapunov's type functions hold on the entire real line , and , therefore , a qualitative approach is necessary to discuss and solve them .

Dorin Ghişa : Some applications of deterministic and stochastic calculus
to life sciences

The paper is devoted to the analysis of the behavior of certain dynamical systems that are proposed as models for ecosystems . Both the deterministic and the stochastic models are analyzed in the paper , and illustrations are presented . For the case of stochastic dynamical systems , a direct approach that is suggested by the basic probability theory is developed .

Virgil Gligor : Non-approximable NP-complete problems

In this paper , the author is developing some ideas that have been presented in detail in a joint paper with Maier David : "Finding augmented set bases " , in SIAM Journal of Computing , Vol. 11 (1982) , 602-609 .

Ilie Popescu : La fonction perturbatrice d'un systeme canonique d'equations differentielles

In order to simplify the presentation , we shall adopt the notations that the author uses in his article "Solutions Periodiques d'un Systeme d'Equations Differentielles " , published in Libertas Mathematica , Vol. III (1983) , 99-106 . The aim of this paper is to present a numerical procedure to find the perturbation function for a canonical system of differential equations of the form (1) in the paper mentioned above . The perturbation function is given in the paper cited above by the formula (19) . Using first order Bessel functions , as well as the series expansion of the Poisson kernel occurring in the expression of the perturbation (perturbing) function , the author provides a series expansion for that function (associated to the system (1)) .

Ion Ratiu : m-sequences and their applications to the testing of large digital networks

m-sequences , or pseudorandom sequences , are binary sequences generated by a primitive polynomial over $GF(2)$, and they can be used in the testing of large digital networks . Specifically , both the generation of the test stimuli and the analysis of the response of the circuit under testing , are based on a linear feedback shift register (LFSR) , a finite state machine implementing the primitive polynomial . Such testing is called pseudorandom testing , and if both the test generator LFSR and the test response analyzer LFSR reside within the

the circuit , the method is called self-test .

Pseudorandom testing eliminates the need for deterministic test generation and its associated data explosion . However , since the test patterns are extracted from the m-sequence and their width is typically much larger than the degree of the primitive polynomial , dependencies may arise among the bits in the patterns . Consequently , certain test patterns are always missed , and the quality of the test process suffers . Although several empirical solutions exist , research on the subject so far has failed to provide a feasible technique to be implemented .

Emilio O. Roxin : The reachable set in the theory of optimal control

The "reachable sets" play a key role in the theory of optimal control . The geometric properties of these set were analyzed in the early days of the development of this branch of modern mathematics , but were later neglected , as they apply more to the question of reachability than of optimality . This paper contains various examples that illustrate some interesting problems , still remaining to be considered by researchers .

Dan Simovici , and Dan Ștefanescu : Galois connections and their applications in Computer Science

This paper is dedicated to the discussion of various applications of Galois connections to Computer Science disciplines , such as : the structural theory of automata , program corectness and verifications , a.o. The authors' contribution in this field consists mainly in applying Galois connections to the design and normalization of relational databases . Details are given in the extended version of the paper .

Samuel Zaidman : Periodic solutions of abstract differential equations with periodic right hand side

This paper continues the research started in a previous paper (Proceedings of the Royal Society of Edinburgh , 1979) , and deals with the existence of mild solutions of periodic nonhomogeneous linear differential equations in an uniformly convex Banach space . Assuming a condition of separation from zero for the bounded nontrivial solutions of the homogeneous equation , one shows that the unique optimal solution of the equation with a periodic right hand side is periodic .

The equation has the form $x'(t) = Ax(t) + f(t)$, where A is the generator of a C_0 - semigroup. In the special case when this semigroup is an isometric group on a Hilbert space, one derives a result which is essentially due to L. Amerio (1960). Such kind of results can be applied to the solutions of the nonhomogeneous wave equation, with right hand side which is periodic with respect to the time variable.

Irinel Dragan : A greedy algorithm for solving some multi-objective discrete programming problems

Let $V = \{v_1, v_2, \dots, v_n\}$ be a finite set, and let \mathcal{P} be a family of nonempty subsets of V . A function $w : V \rightarrow \mathbb{R}_+$, assigning to each $v \in V$ a nonnegative weight $w(v)$, is extended to \mathcal{P} by means of $W(P) = \sum_{v \in P} w(v)$, for any $P \in \mathcal{P}$. The kind of problem considered in this paper can be formulated as follows: given a positive integer K , find the set of the K best solutions $P_1, P_2, \dots, P_K \in \mathcal{P}$, i.e., such that

$$W(P_1) \geq W(P_2) \geq \dots \geq W(P_K) \geq W(P), \text{ for any } P \neq P_j,$$

$j = 1, 2, \dots, K$. This problem is denoted by $K - P$. A specific $K - P$ problem can be stated as follows: Assume a digraph $G = (V, A)$, without circuits, and a nonnegative weight function $w : V \rightarrow \mathbb{R}_+$ are given. \mathcal{P} denotes the family of directed paths of G , and w is extended to \mathcal{P} as shown above. Find the k best directed paths for $k = 1, 2, \dots, K$, for a given positive integer K . This problem is suggested by the application of an algorithm for solving multi-objective discrete programming problems in the case of multi-objective optimization path problems. The basic problem solved in this paper is the following one: Find a greedy algorithm solving the $1 - P$ problem in a digraph $G = (V, A)$. The successive steps of this greedy algorithm are described in detail. In general, a greedy solution is not necessarily an optimal solution. Moreover, in general it is not possible to solve a $1 - P$ problem in a weighted digraph by a greedy algorithm. In a preceding paper (Libertas Mathematica, vol. III, 1983), the author has given a characterization of those weighted digraphs in which the $1 - P$ problem can be solved by a greedy algorithm. The more general problem, the $K - P$ problem, can be also approached by combining the author's ideas with some procedures used earlier by Lawler and Hamacher on matroids. This approach for solving $K - P$ problems in weighted graphs without circuits can be used for solving some multi-objective path problems, as shown in a recent paper by Hamacher. Extensions of this approach are also possible.

George Isac : Positive eigenvalues and complementarity problem

Assume E is a locally convex space , and \langle , \rangle is a bilinear form on $E \times E$. Let $K \subset E$ be a closed convex cone , and $f : E \rightarrow E$ a mapping . The explicit complementarity problem (E.C.P.) can be stated as follows : find $x_0 \in E$, such that $x_0 \in K$, $f(x_0) \in K$, $\langle x_0, f(x_0) \rangle = 0$. Given two mappings $g , h : E \rightarrow E$, and an element $b \in E$, the implicit complementarity problem (I. C. P.) can be formulated as follows : find $x_0 \in E$, such that $g(x_0) - x_0 \in K$, $b - h(x_0) \in K$, while the product $\langle b - h(x_0), g(x_0) - x_0 \rangle = 0$. These two problems , the (E. C. P.) and the (I. C. P.) , are encompassing a variety of problems arising in : Mathematical Programming , Optimization Theory , Economic Equilibrium Theory , Structural Mechanics Elasticity Theory , and Stochastic Optimal Control . The aim of this paper is to develop a unified theory for solving such problems , using coincidence equations on convex cones . Using the concepts of locally convex lattices , and that of a Banach lattice , the author establishes various interesting connections between the coincidence equations associated to the complementarity problem , and the eigenvalue problem .

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A N N O U N C E M E N T

The X-th Annual Convention of the American Romanian Academy of Arts and Sciences will be held from May 2 - 4 , 1985 , at the University of California at Berkeley . The Chairperson of the local organizing committee is Professor Paola Timiraş , Head of the Department of Physiology at UCB . We take the opportunity to remind the reader that this is a festive meeting , dedicated to the 10-th anniversary of foundation of A. R. A.

We are planning again a Mathematical Session , and we make an appeal to our colleagues to participate to this convention and present a paper from the field of research of their own interest .

Intention to participate should be communicated to the organizing local committee by the end of October , 1984 . Please feel free to communicate also , on these matters , with Professor C.Corduneanu , A.R.A. Counselor for Sciences .

FROM THE BOOKSHELVES

CONSTANTIN VIRGIL NEGOITA : Fuzzy Systems and Expert Systems . The Benjamin/Cummings Publishing Company , Inc. , Menlo Park , California , 1984 , 224 pp.

This book is the first to discuss methods in dealing with fuzziness in the expert systems' knowledge-base , using all the fundamentals of approximate reasoning . Any person interested in expert or knowledge-based systems will find the book a valuable addition to the understanding of the logical design . People rely on knowledge-based computer systems to make decisions (both life-saving and money-saving) . Usually , the knowledge-base of a typical expert system is imprecise and incomplete . The crucial issue in the design of an expert system is how to handle uncertainties . This unique book allows the reader to explore the effects of the semantic system on decision support systems . It includes realistic status reports in approximate reasoning and knowledge representation supported by a modern mathematical approach , based on the theory of categories .

WALTER HENGARTNER , MARCEL LAMBERT , and CORINA REISCHER : Introduction a l'Analyse Fonctionnelle . Presses de l'Universite du Quebec , Montreal , 1981 , V + 538 pp.

This volume constitutes a textbook for an introductory course in Functional Analysis . Contents : 1. Preliminaries ; 2. Linear spaces ; 3. Metric spaces ; 4. Hilbert spaces ; 5. Linear functionals ; 6. Linear operators ; 7. Linear operators on a Hilbert space ; 8. Spectral theory ; 9. Functions of bounded linear operators and spectral decomposition . The book is addressed to students in pure or applied mathematics , as well as to students in science and engineering . In order to meet the needs of such a diverse audience , there are many examples discussed in the text , before a basic theorem is presented with the rigorous proof . The student will need as a prerequisite to this course a reasonable acquaintance with classical analysis , both real and complex , as well as a certain degree of familiarity with linear algebra . Each chapter ends with exercises and topics of discussion (projects) . The exercises are supposed to be simple applications of

the basic results given in each chapter , while the projects represent new subject matter that are closely related to the text . The projects have a three-fold goal : a. to deepen the content of each chapter ; b. to teach the student to work out a mathematical exposition ; c. to broaden the field of applications of functional analysis .

SILVIU SBURLAN : Gradul topologic (Lectii asupra ecuatiilor neliniare). Editura Academiei Republicii Socialiste Romania , Bucureşti , 1983 , 254 pp.

This book is written as an introduction to the theory of the topological degree of a map , with applications to the study of certain classes of nonlinear equations . The basic ideas and results contained in this book have made the object of a series of lectures given by the author for the students in Mathematics with the University of Bucharest . The book is divided in four chapters , as follows : the Chapter I discusses Nagumo's approach to the finite-dimensional degree theory , and outlines Heinz' model for Brouwer's degree . Basic results are included in this chapter , most of them due to Brouwer , Poincare , Borsuk , and Djugundji . Chapter II contains the general theory of the topological degree in normed linear spaces . The axiomatic definition of the topological degree due to Amann and Weiss is adopted . Fixed point theorems are then proved using the concept of degree . Bifurcation problems and nonlinear eigenvalues problems are also dealt with in this chapter . Chapter III deals with various extensions of the degree theory , such as the degree of condensing maps , the coincidence degree , the degree of multi-valued mappings , and other kinds of mappings . A further development of degree theory , due mainly to Furi-Martelli-Vignoli , is presented in this chapter . Finally , the Chapter IV contains various applications of degree theory to some difficult problems encountered in connection with nonlinear differential or integral equations : Hammerstein-Urysohn integral equations , boundary value problems for ordinary differential equations , periodic solutions , boundary value problems for elliptic equations , as well as bifurcation theory applied to Sturm-Liouville problems and quasilinear elliptic boundary value problems . Exercises and complementary topics are discussed at the end of each chapter . The presentation is clear and rigorous , and assumes the basic knowledge of the Mathematical Analysis at the advanced level . This book constitutes a valuable addition to the existing literature in this field , and is highly useful for mathematicians , engineers and scientists interested in Nonlinear Analysis .

RALPH ABRAHAM , JERROLD E. MARDSEN , and TUDOR RATIU : Manifolds , Tensor Analysis and Applications . Addison-Wesley Publishing Company , Reading , Massachusetts , 1983 , XIX + 582 pp.

This book is published in the series "Global Analysis (Pure and Applied)" , and constitutes a valuable addition to an area which knows a fast development . It is particularly aimed at presenting , in a modern fashion ; the basic mathematical methods necessary in the study of nonlinear phenomena occurring in Science and Engineering . The authors view this book as a possible text for beginning-graduate-level courses . Contents : 1. Topology ; 2. Banach spaces and differential calculus ; 3. Manifolds and vector bundles ; 4. Vector fields and dynamical systems ; 5. Tensors ; 6. Differential forms ; 7. Integration on manifolds ; 8. Applications . There are several appendixes , dedicated to various topics : Zorn's lemma and Baire spaces ; The three pillars of linear analysis ; Un bounded and self-adjoint operators ; Stone's theorem ; The Sard and Smale theorems . The target of the series of textbooks to which the present one belongs is to make Global Analysis more accessible to the reader . "A growing number of scientists of all disciplines have discovered that the techniques of global analysis have important applications in their own fields ; they are seriously looking for keys to these techniques . This series will attempt to provide the keys " .

ARISTIDE HALANAY , and VASILE DRAGAN : Perturbații singulare ; dezvoltări asimptotice . Editura Academiei Republicii Socialiste Romania , București , 1983 , 221 pp.

This book is a research monograph and contains results that have been obtained by the authors during the last years of common work . Of course , there are a few basic results which are classical , and whose primary role is to facilitate the readers's task . As the authors state into the English abstract placed at the end of the book , they have been concerned in the past years with the investigation of various optimal control problems for processes with several time scales . In a joint work with an engineering team they built up a mathematical model for a synchronous machine . Due to the fact that both mechanical (slow) and electrical (fast) phenomena appear , the necessity of several time scales is fully justified by this unique model . The asymptotic expansions for solutions , in which a small parameter occurs are of utmost importance . The authors have devised their own way of handling these expansions . Contents : 1. Linear systems (Asymptotic expansions of their solutions) ; 2. Affine systems (i.e. , non-

homogeneous linear systems) ; 3. Nonlinear systems (of the form $\dot{x} = f(t, x,)$) ; 4. Singularly perturbed Ito equations . To facilitate the reader's task , the authors have collected in three Appendixes a few topics that are of current use in their exposition : Properties of solutions of linear systems of differential equations ; Stochastic differential equations (basic properties) ; Difference systems with small step-size . The book presents a high interest to researchers in control theory , and we think its translation into English would be welcome . A second volume is promised by the authors .

ISAAC J. SCHOENBERG : Mathematical time exposures . The Mathematical Association of America , 1982 , 269 pp.

This book contains eighteen chapters , each chapter being dedicated to a different mathematical problem . The author has been inspired by the "Mathematical Snapshots" published by Hugo Steinhaus in 1939 . However , he has chosen to devote more time to fewer subjects , and the "snapshots" become "time exposures". Problems from Geometry , Number Theory , Algebra and Analysis appear sometimes mixed together in the same chapter . The author seems to be preoccupied with the connection in between mathematical ideas and methods and other fields of knowledge or even the Arts . A special place occupies the Chapter 10 , in which the author deals with Spline Functions which have revolutionized recently the graphic representation of experimental data . The author's role in creating this class of functions , and showing their significance in contemporary Mathematics is well known to the mathematical community . As the author states , this book is "gratefully dedicated to the memory of Victor Costin , Alexandru Myller , Vera Myller Lebedeff , Simion Sanielevici , my teachers at the University of Jassy , Romania". This book is highly recommended to any mathematician or scientist with interest in mathematical thinking , as a unique experience in approaching and solving problems (very easy to be stated sometimes , but highly stimulative in searching for solutions) .

FLORENTIN SMARANDACHE : Generalizations et generalites . Edition nouvelle , 1984 . Fes (Morocco) , 53 pp.

The author is a teacher with the Sidi El Hassan Lyoussi Lyceum in Sefrou , Morocco , and this brochure contains some of his contributions toward the generalization of classical results due to Minkowski , Tchebychev , Hölder , Euler , Carnot , Ceva , Cauchy - Buniakovski-Schwartz , and others . Most papers in the

volume have been published earlier in *Gazeta Matematica* (Bucureşti), or in other journals. The material included is of great interest for high-school teachers, gifted students with special interest in Mathematics, and for those interested in quite sophisticated "elementary" mathematics.

FLORENTIN SMARANDACHE : *Problemes avec et sans ... problemes*. Societe Marocaine d'impression et d'equipement (S.A.R.L.), Fes, Morocco, 1983.

This book has been translated from Romanian into French by the author, and Sophie Mignier (Professeur de Mathematiques). In 175 pages, the book displays 140 problems related to the following mathematical disciplines: Arithmetic, Mathematical Logic (elementary), Trigonometry, Geometry, Algebra, Calculus. Each problem is accompanied by a detailed solution. The author claims originality for these problems. Most of them have been published before in various mathematical periodicals addressed to high-school teachers, students with special interest in mathematics, under his name.

VASILE I. ISTRĂŢESCU : *Strict convexity and complex strict convexity*. Marcel Dekker, New York - Basel, 1984 (Lectures Notes in Pure and Applied Mathematics Volume 89).

From author's foreword: "Interest in geometric properties of Banach spaces is due, to a great extent, to the fact that the linear topological properties, which are extremely useful in applications, are inseparably linked with a fixed geometric object, namely, the closed unit ball of the space. Thus, we are led naturally to consider linear topological properties within the framework of a given norm on the space. The purpose of this book is to present a comprehensive survey of those properties of a Banach space related to strict convexity, together with some applications". The Contents: 1. Banach spaces; 2. Strict convexity (including applications to approximation theory, fixed points and probabilistic metric spaces); 3. Complex strict convexity; 4. Classes of operators and the geometric structure of Banach spaces. This is a useful book on topics attracting more and more interest among specialists in pure and applied modern analysis.

NEW Ph D IN MATHEMATICS

VICTOR TRUTZER : "Existence and asymptotic stability for solutions to stochastic hereditary equations"

This Ph D Dissertation has been submitted in 1982 to the Carnegie Mellon University in Pittsburgh , PA . Professor Victor Mizel was the major professor . The author has been granted the Ph D degree in Mathematics .

The Journal of Integral Equations , Vol. 7 (1984) , pp. 1-72 , publishes the paper "Stochastic Hereditary Equations : Existence and Asymptotic Stability" under joint authorship of Victor J. Mizel and Victor Trutzer . This paper contains most of the material included in the dissertation .

ANCA LUMINITA RALESCU : "General rates of decay for weighted empirical processes"

This Ph D dissertation has been submitted in 1983 to Indiana University , Bloomington , IN . Chairman of the defence Committee was Professor Victor W. Goodman . The author has been granted the Ph D degree in Mathematics .

An abstract of this dissertation has been inserted in the publication "Dissertation Abstracts International" , Vol. 44 , June 1984 .

ION RATIU : "VICTOR : Global redundancy identification and test generation for VLSI circuits"

This Ph D dissertation has been submitted to the University of California at Berkeley in 1983 . The examining committee was chaired by Professor Donald Pederson (Electrical Engineering) , and members were Professor Chittor Ramamurthy (Computer Sciences) , and Michael Klass (Statistics) . The author has been awarded the Ph D degree in Electrical Engineering , on May 4 , 1983 .

The dissertation has appeared as Memorandum No. UCB/ERL M83/27 (Electronics Research Laboratory , College of Engineering , UCB) . Following is the

abstract of this dissertation , as it appears in the Memorandum .

During the generation of tests for a digital circuit , most of the effort is spent on just a few faults . For some of these faults, even an exhaustive search cannot find a test , because no test exists ; the fault is redundant , and the effort has been wasted . For some others , a test can be found only after much computation , but most test generation procedures allocate fixed resources (computer time and memory) per fault and may stop the computation before the fault is detected . These hard-to-test , but detectable faults are likely to be considered undetectable , hence lumped with the redundant faults , and effort has been wasted again . Therefore ,efficient test generation for a digital circuit requires advance knowledge of the redundant and the hard-to-test irredundant faults . The aim of the dissertation is to describe VICTOR (VLSI Identifier of controllability , Testability , Observability and Redundancy) , a linear complexity method for global redundancy identification and test generation for scan - testable VLSI circuits . In four passes through the circuit fault list , VICTOR identifies all redundant and hard-to-test irredundant faults in a general combinational circuit , and generates test vectors for most irredundant faults , which are then collapsed and the corresponding test vectors are compacted . The complexity of the algorithm and of the data structure grows linearly with circuit size , and primary input count . Several circuit examples are analyzed to illustrate the operations involved in the algorithm .

The program implementation of VICTOR consists of approximately 4300 lines of ANSI FORTRAN 77 .

Editor's Note : Without possessing complete information , I would like to mention that Florin R. David (Courant Institute , NYU) , and Alex Suci (Columbia University , New York) have defended their Ph D theses during 1984 . We will return in subsequent volumes with complete information .

AMERICAN ROMANIAN ACADEMY OF ARTS AND SCIENCES

B Y L A W SPREAMBLE

Scholars and artists of Romanian origin living on American soil , as well as a number of American scientists specializing in Romania civilization , culture and language , guided by the aspiration of serving both the American and the Romanian nations through creative scientific and cultural activity , do establish :

The American Romanian Academy
of Arts and Sciences

as a "non profit organization" .

I. Purpose and Character of the Academy

Art. 1. The Academy has the following objectives :

- (a) to foster the various spiritual values of Romanian civilization in the framework of the American socio-cultural structures ;
- (b) to strengthen the cultural and spiritual ties between the people of the United States and the Romanian nation , as means to expand the freedom of artistic or scientific creativity ;
- (c) to provide in the United States , for the Romanian nation , a constant "point d'appui" at the scientific and cultural levels , independent of the political and governmental relationships between United States of America and Romania .

Art. 2. In order to achieve its goal , the American Romanian Academy of Arts and Sciences shall preserve and strongly defend its independence , by avoiding any affiliation to other organizations or its subordination to Associations or groups of any type .

Art. 3. The residence of the American Romanian Academy (A.R.A.) will be that of its President . The President represents the A.R.A. de facto and de jure .

II. The Members , their categories , Admission Procedures, Cessation of Membership

Art. 4. The A.R.A. consists of :

- (a) full members ; (b) associate members ; and (c) honorary members .
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Art. 5. The full members are elected according to the following criteria :

(a) Their activity in the field of their specialization , with publications or exhibitions of value , recognized by their respective scientific or artistic circles ;

(b) Their concern for the ideals of promoting Romanian culture under conditions free from political pressures . Any member of the A.R.A. has the right to recommend to the President - by a documented report - the admission of a new member into the Academy . The President will ask also the advice of a full member in a domain close to the special field of the candidate . In the event , this advice is favorable , the President shall transmit in writing the proposal to all full members of the Academy , together with all necessary data in view to enable the members to be informed about the academic (scientific or artistic) activities of the candidate .

In this proposal , the President will specify the candidate's status in his or her country of residence in order that it may be established whether the candidate is in a position to undertake lasting collaboration with the A.R.A. in the spirit of freedom stipulated by the Bylaws . The admission as a member is obtained by two thirds of the votes received by mail from the full members , provided that the number of ballots received represents the majority of the total number of the full members of the A.R.A.

Art. 6. The admission of the associate members follows a procedure similar to that described in Art. 5 . However , their admission is justified primarily by the moral and material support they offer the Academy .

Art. 7. Persons who have rendered particular services to the Academy or have substantially contributed to the fulfillment of its goals may be appointed honorary members at the President's proposal and with the approval of the Executive Committee ; the honorary members are exempted from the annual dues .

Art. 8 . Only the full members have the right to vote .

Art. 9 . The quality of member is lost by anyone who :

(a) departs from the stipulations of Articles 5 or 6 of the Bylaws ;

(b) offers a written resignation to the President ;

(c) does not pay the annual fees during two consecutive years .

Membership is automatically terminated in the case specified under (c) , at

the Secretary-Treasurer's acknowledgement ; and in the case specified under (b) , at the acknowledgement of the President . These acknowledgements should be included in the Minutes of the next meeting of the Executive Committee . In the case under (a) , the situation should be submitted by the President to the Grievance Committee (see Art. 27) following a notice given by the Executive Committee . The Grievance Committee will proceed to its investigation and will present its report to the President (see Art. 17) .

III. The Governing Bodies

Art. 10. The General Assembly takes place once a year at the time of the Congress (ordinary meeting) , or more than once yearly , if called in extraordinary meeting by the President. The President summons the Assembly by circular letter addressed to full members , one month before the date which has been decided for the meeting . The agenda of the meeting shall be attached to the letter . Associate members may participate in discussions , but decisions are taken by the majority of votes of the full members .

Before a General Assembly may be duly constituted , the personal presence of at least ten full members is required . Decisions of the General Assembly require a majority of 50 percent plus one of those members who are present in person or who have provided a written proxy . If , by any lack of "quorum" , the meeting cannot be assembled , the President , with previous approval of the Executive Committee , may consult all the full members by mail , based on the established agenda .

The results will be communicated by the President to all members and inserted in the next Bulletin .

The General Assembly deliberates on the order of the day , discusses and approves the reports of the President and of the Secretary-Treasurer , approves the balance sheet of incomes and expenditures , elects the members of the Executive Committee who will serve for three years , decides the place , the university and the date of the next Congress and General Assembly and elects the members of the Grievance Committee .

Art. 11. The Executive Committee conducts the activity of the A.R.A. between the annual congresses . The Committee is composed of nine members , elected for a three-year term by the General Assembly , namely : The President , the Vice President , the Secretary-Treasurer and six Counselors .

1. The President represents the A.R.A. , presides over the Congresses and the General Assembly , approves the programs of the annual Congresses in agreement with the decisions taken by the General Assembly , supervises the carrying through of the decisions taken by the General Assembly , conducts the procedures for the election of new members (cf. Art. 5 , 6 , 7) , approves the expenditures going beyond the scope of current and routine administration , summons the General Assembly meeting at least once a year , at the date of the Congress . At least once a year , the President informs all full , associate and honorary members by circular letter about the activities of the Academy (in relationship with Congresses , Publications , Studies , Exhibitions , Festivals , Financial Matters , etc.) , communicates to all members by special circular letter : the admission of new members , the cases of cessation of status of membership , the recommendations of the Grievance Committee .

2. The Vice President acts as substitute for the President in case of need and assists the President especially in problems related to publications .

3. The Secretary-Treasurer draws up the minutes of the meetings of the General Assembly and of the Executive Committee , carries on the task assigned to him by the President , administers the assets of the Academy , keeps the account book , writes the financial reports , and makes payment of the expenditures needed by the activities of the Association under the supervision of the President . The Secretary-Treasurer submits the balance sheet , including the income and expenditures for approval before the Executive Committee at each of its meetings .

4. The six Counselors correspond to the various branches of activity of the Academy in agreement with the specifications below (see Art. 13) . At the request of the editors in charge of the publications of the A.R.A. , the counselors report on the works submitted to publication which fall within the competence of their own general fields of activity . They also report to the Scientific Committee of Congresses in matters related to papers on subjects close to their competence in view of organizing the programs by sections .

The Executive Committee takes decisions in any matter falling within its competence . The Executive Committee is summoned by the President whenever he or she considers it necessary . The letter of convocation shall include the agenda of the meeting , asking that those members who are not able to participate in person should send their votes by mail ; for matters of emergency , the President may con-

sult the members of the Executive Committee by telephone or telegram . The decisions of the Executive Committee as well as the voting procedures shall be inserted in the official report of the proceedings , which will be submitted for approval at the next meeting , and published in the next Bulletin of the Academy .

IV. The Activities of the Academy

Art. 12. As an institution promoting Romanian studies , the A.R.A. intends to introduce and stimulate knowledge of the cultural values of the Romanian nation in international circles , by encouraging research into the various domains of the humanities , positive sciences and arts . The studies undertaken by A.R.A. in these domains will examine the Romanian past and present , as well as various Romanian creations (artistic or scientific) achieved inside or outside Romania , in the framework of the orientations and cultural perspectives of the contemporary free world .

Art. 13. The activities of A.R.A. include Congresses , publications , art exhibitions and music festivals .

1. Congresses are annual meetings of academic standard in which the full members , the associate members , as well as other persons interested in Romanian culture , may participate and present papers . The inclusion of papers in the program will be made on the basis of abstracts (sent before the date indicated by a circular letter) , after approval of the congressional scientific committee composed of the President , counselors , as well as the local organizer . The congresses take place annually in the locality and at the university selected by the general Assembly of the preceding year .

2. The Publications consist of : volumes , periodicals and bulletins . The editorial practices adopted in these publications will conform to those followed in scholarly Societies in the United States . The editing of each volume , bulletin or periodical , is assigned to an editor by the Executive Committee at the proposal of the President , following a written report of the Vice President .

3. Exhibitions are generally organized similarly to other parts of the congressional programs - at the place and time scheduled for congresses . They can also be organized separately by a decision of the Executive Committee .

4. Music Festivals are generally organized at the time of congresses and are designed to promote and encourage the free creation of Romanian music. Festivals can also be organized separately following decision of the Executive Committee.

V. Financial Matters

Art. 14. The financial resources of the Academy are :

- (a) The annual fees of members established by General Assembly ;
 - (b) Donations made by individuals , foundations or private corporations .
- Acceptance thereof is subject to the decision of Executive Committee .

Art. 15. The A.R.A. shall proceed to the election of a Fund-Raising Committee from individuals and private institutions for publication of A.R.A. volumes , bulletins and periodicals . The Committee will be composed of five to seven persons elected by the General Assembly for a three-year term . The Fund-Raising Committee will work under the general supervision of the President . The funds are part of the assets of the Academy , to be used for meeting the costs of printing A.R.A. publications .

VI. The Grievance Committee

Art. 16. Any member of the A.R.A. has the right to address a written complaint referring to : violations of the bylaws ; activities within the Academy inconsistent with its aims ; and financial irregularities . The complaint , giving a truthful and documented presentation of the facts , must be signed before a notary public . The President will submit the complaint to the Grievance Committee for investigation and report . The complaint has a confidential character .

Art. 17. The Grievance Committee is composed of three members elected by the General Assembly for a three-year term . Its members cannot be at the same time members of the Executive Committee . For the first year , the President of the Grievance Committee shall be the eldest of the three members . Then , the President may pass the function to other members of this committee by agreement among them . The solution of a complaint should not be delayed for more than 60 days from the date of its presentation to the President of A.R.A.

If the Grievance Committee needs an extension of time , the President of A.R.A. may grant another delay of a maximum of 30 days , by which time the procedure must be completed . The documented opinion of the Grievance Committee shall be submitted for decision to the Executive Committee . The decision will be communicated to the claimant by the President of A.R.A. by registered letter . The claimant retains the right of appeal to the General Assembly .

VII. Amendment of the Bylaws

Art. 18. Any amendment of the Bylaws falls within the jurisdiction of the General Assembly . The Assembly reaches decisions in this matter by a majority of two-thirds of the total number of full members of A.R.A. , voting in person or by proxy . The text of any proposed amendment should be attached to the letter of convocation sent by the President to all full members one month before the date of the Assembly , together with the agenda and with a statement confirming that the proposed text has been approved by the Executive Committee .

VIII. Final Provisions

Art. 19. In the extreme event in which the purposes of the Academy could no longer be achieved , A.R.A. could be dissolved . The dissolution of A.R.A. will be decided by at least two-thirds of the votes of the members of the Executive Committee . The decision of the Executive Committee must be approved by a special meeting of the General Assembly with a two-thirds majority of votes . In case of dissolution the entire assets of the A.R.A. shall be transferred to the "Hoover Institution for War , Revolution and Peace" of Palo Alto , California , which has already treasured other important Romanian documents .

Art. 20. The English version of the present Bylaws is the only authentic or juridically valid one .

Art. 21. The present Bylaws of A.R.A. replace the Bylaws of September 16 , 1975 .

MARIA I. MANOLIU-MANEA - President
American Romanian Academy of Arts and Sciences

NICHOLAS TIMIRAS - Vice President
American Romanian Academy of Arts and Sciences

MIRON BUTARIU - Secretary-Treasurer
American Romanian Academy of Arts and Sciences

Davis , California April 2 , 1983

Note . The text of A.R.A. Bylaws has been approved by referendum of A.R.A. members , February 1983 .

P E R S O N A L I A

Dr. FLORIAN POTRA has been appointed to a position of Associate Professor with the Department of Mathematics , University of Iowa , Iowa City , Iowa , starting September 1-st , 1984 .

Professor DAN A. SIMOVICI has been appointed Director of the Computer Science Program at the University of Massachusetts in Boston .

Professor CIPRIAN FOIAS from the Indiana University in Bloomington , Indiana , held a Visiting Professorship at the Mathematical Research Institute in Berkeley , California , where he participated in the special program dedicated to Ergodic Theory and Dynamical Systems . He also participated in mathematical conferences and seminars at the Arizona State University in Tempe , Arizona , and Santa Fe , New Mexico .

Professor CONSTANTIN CORDUNEANU from the University of Texas in Arlington has participated in the International Conference on "Integrodifferential Evolution Equations" organized from September 2 - 8 , 1984 , in Trento - Italy . He is a member of the local organizing committee for the International Conference on "Integral Methods in Science and Engineering" to be held in March , 1985 , at the University of Texas at Arlington .

Dr. MAGDA PELIGRAD , and Dr. COSTEL PELIGRAD have been appointed as faculty members with the Department of Mathematics , University of Cincinnati , Cincinnati Ohio .

Professor GEORGE ISAC from the College Militaire Royal de Saint-Jean , Quebec , Canada , is spending his sabbatical year at various European Universities . He will be most of the time during the Fall semester with the University of Limoges , France . The Spring semester he will be spent at the University of Cape Town , South Africa .

Professor CONSTANTIN NEGOITA from the Hunter College of CUNY has participated in the International Conference dedicated to the "Mathematics of Fuzzy Systems" . He

presented a paper entitled "Categorical Foundation of Knowledge Engineering" and chaired one of the sessions of the conference . The conference has been held in Napoli , Italy .

Dr. DAN PASCALI is visiting the Center for Nonlinear Studies at Los Alamos National Laboratories in Los Alamos , New Mexico . He has been also invited to participate in the program "Continuum Physics and Partial Differential Equations " sponsored by the Mathematical Research Institute in Minneapolis , Minnesota .

Professor RADU ROȘCA from Paris-France is 75 years old this year . On behalf of Romanian mathematicians we send him the best regards and warmest congratulations for his anniversary . Biographical data regarding Professor Radu Rosca is contained in Libertas Mathematica , vols 1 and 3 .

Professor ARISTIDE HALANAY from the University of Bucharest is 60 years old in 1984 . We send him congratulations and best wishes for this anniversary . Halanay is well known to the International Mathematical Community as a prominent contributor to the field of Differential Equations , Equations with Delay , Control Theory and related areas . He has authored the book "Differential Equations; Stability , Oscillations , Time Lag" , published by Academic Press in 1966 (translation of a Romanian version) . He is the coauthor (with Dinu Wexler) of a book on the qualitative theory of pulse systems . His last book is presented in this volume of Libertas Mathematica (see the Section "From the Bookshelves") . Halanay is on the editorial board of the Journal of Differential Equations , Revue Roumaine de Mathématiques Pures et Appliquées , and other journals .

Dr. SORIN ISTRAIL , formerly with the Faculty of Mathematics of the University of Iași , Romania , has recently immigrated to the United States . He has been appointed to a Professorship at the Wesleyan University , Middletown , Connecticut .

THE AUTHORS OF VOLUME IV

JACQUES ALLARD is currently an Associate Professor of Mathematics at the University of Moncton , N.B. , Canada . He obtained his B.S. degree from the University of Montreal in 1971 , and the M.Sc. and Ph D degrees from the University of British Columbia in 1973 , and 1977 respectively . He spent the academic year 1977 - 1978 as a postdoctoral fellow at the Mathematical Institute of Oxford University . The academic year 1978 - 1979 , again as a postdoctoral fellow , has been spent at the Department of Mathematics and Statistics , University of Montreal . Since 1979 , Jacques Allard is associated with the University of Moncton . His current research interests are in modern Algebra and Analysis .

CONSTANTIN CORDUNEANU (see the biographical note in the Volume I of *Libertas Mathematica* , 1981) .

G. D. DAHERI is a graduate student at the Indian Institute of Technology in Kanpur , U. P. , India . He received his B. Sc. degree in Mathematics , and the M. Sc. degree from Sambalpur University in 1976 and 1978 respectively . He is currently working toward a Ph D degree in Mathematics , under the guidance of Professors P.K. Kamthan and Manjul Gupta . His field of specialization is Holomorphy .

DORIN GHIŞA is currently an Associate Professor of Mathematics with the University of Moncton , N. B. , Canada . He received his M. Sc. in Mathematics from the University "Babeş-Bolyai" in Cluj (1963) , and his Ph D in Mathematics from the University of Bucharest (1976) . The dissertation title was : "Quasiconformal mappings on Riemann surfaces" . The committee of defence consisted from Professor Cabiria Andreian-Cazacu , Professor Aurel Cornea , and Professor Petru Caraman . From 1963 to 1976 , Dorin Ghisa held various positions at the University of Timisoara (last position : Assistant Professor) . From 1976 to 1980 , he was a visiting Associate Professor at the University of Algiers . He spent the academic year 1980 - 1981 in Montreal , holding temporary positions at the Polytechnic of Mon-

treil , and at the University of Montreal . Since 1981 , Dorin Ghisa is with the University of Moncton , N.B.,Canada . During the two decades of association with the institutions of higher education mentioned above , Dorin Ghisa has taught courses in Complex Analysis , Differential Equations , Probability and Statistics, Real Analysis , Rational Mechanics , a.o. His major research interests were in Complex Analysis , but he has been involved also in different other areas of research (Mathematical Modelling in Biology , Differential Equations , Real Analysis , Stochastic Theory) .

P.K.KAMTHAN is Professor of Mathematics at the Indian Institute of Technology in Kanpur , U.P., India . He has obtained his B.Sc. degree from Lucknow University in 1957 , his M.Sc. degree from the same school in 1979 , and the Ph D in Mathematics from Rajasthan University in 1965 . He has also obtained a D. Sc. degree from Jabalpur University , in 1976 . He held numerous regular/visiting positions before becoming a Professor at the Indian Institute of Technology : Delhi University , McMaster University , University of Waterloo , University of Frankfurt . Dr. Kamthan has authored more than 130 papers , published in journal with established prestige , mainly in the following research areas : Convex Functions ; Entire and Meromorphic Functions ; Locally Convex Algebras : Schauder Bases and Decompositions ; Sequence Spaces ; Nuclear Operators and Spaces ; Representation Theory of Operators and Applications to Quantum Mechanics . He is the co-author (with Professor Manjul Gupta) of two monographs : "Sequence Spaces and Series" , Marcel Dekker , New York , 1981 , and "Bases and Cones" , under publication at Pitman , London .

ANDRZEJ KORZENIOWSKI obtained his Ph D degree in Mathematics from the Wroclaw University (formerly Breslau) , in 1978 . His major professor was K. Urbanik , a member of the Polish Academy of Sciences . His thesis subject was devoted to the study of random elements in Banach spaces . Current research interests cover Probability Theory and Functional Analysis . He came to the United States in 1981 , and from 1981 to 1983 he held a visiting position of Assistant Professor at the Southern Illinois University in Carbonadale . In 1983 he joined the faculty at the Department of Mathematics , University of Texas at Arlington , where he hold now a postion of Assistant Professor .

CONSTANTIN NEGOITA is currently a Professor of Computer Sciences at the Hunter College , The City University of New York . He was born and educated in Romania ,

where he has obtained his degrees . While in Romania , Dr. Negoita held numerous teaching and research positions , and for a long period of time he was associated with the National Institute of Informatics (Computer Sciences) , where he has coordinated research efforts , and has been involved in various administrative projects . Dr. Negoita is the author/coauthor of several well known monographs and textbooks in the relatively new research direction of Fuzzy Sets . Two of the books published by Dr. Negoita are reviewed in Libertas Mathematica (Vols III and IV) . Other books are : "Management Applications of System Theory" , Birk - hause Verlag , Basel , 1979 ; "Applications of Fuzzy Sets to System Analysis" , a joint project with Dan Ralescu , Birkhauser Verlag , Basel , 1975 . He also takes active part in journal publication , being one of the founder and the edi- tor of the internationally known "Fuzzy Sets and Systems" (First volume came out in 1978) .

ION PARASCHIVOIU is currently a research fellow with the I.R.E.Q. (Institut de recherche d'Hydro-Quebec , Varrenes , Quebec , Canada) , where he holds a position of Senioe Scientist , and is associated with Wind Turbine Group . Dr. Paraschi- voiu was born and educated in Romania , where he also held research positions with the Institute of Fluid Dynamics , at that time under the directorship of the well known specialist in Aerodynamics Elie Carafoli . His Ph D thesis , defended at the Polytechnic Institute of Bucharest in 1974 , was entitled " The study of delta wings with variable geometry" . He is maintaining the research interests in the field of Fluid Mechanics , in which he is a very active contributor .

DAN PASCALI (see the biographical note in Volume III of Libertas Mathematica , 1983) .

ILIE POPESCU (see the biographical note in Volume III of Libertas Mathematica , (1983)) .

RADU ROȘCA (see the biographical note in the Volume I of Libertas Mathematica , 1981 ; see also more biographical data in Volume III , 1983 , pp. 170 - 172) .

DAN SIMOVICI (see the biographical note in Volume II of Libertas Mathematica , 1982) .

IOANA TRIANDAF was born in Iași - Romania , where she went to high school and college . After high school graduation in 1979 , from the prestigious Liceul In- ternat , she became a student with the University of Iași , majoring in Mathe-

matics . In the Summer of 1983 , after obtaining her Diploma in Mathematics from the University of Iași , she attended courses in Italy . She decided not to return to Romania , and was admitted as an immigrant to the United States . She spent the Spring Semester 1984 at the University of California at Irvine , as a Teaching Assistant . Starting September 1 , 1984 , she will become a Graduate Student and a Teaching Assistant at the University of Minnesota , Minneapolis . Ioana Triandaf belongs to a distinguished family of intellectuals from Iași , which counted among its members several university professors , medical doctors , and other prominent professionals .

COLIN GODFREY is an Associate Professor with the Department of Mathematics at the University of Massachusetts in Boston . His current research interests are concentrated in Measure Theory and Algebra .

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AN APPEAL ON BEHALF OF DR. SILVIU TELEMAN

In the January 1984 issue of the Notices of the American Mathematical Society , Dr. Nicolae Teleman - a Professor with the SUNY at Stony Brook - inserted the following appeal on behalf of his brother Silviu Teleman , a member of the AMS , who lives in Romania with his family , and who applied for an exit visa from Romania . Of course , such action usually implies being harassed by the Romanian authorities .

"In November 1981 , Silviu Telema , his wife and their two sons applied for exit visas from Romania . Since then , three times their exit visas were denied . Silviu , a person of high moral integrity , asks that elementary rights of any individual to emigrate be recognized to him and his family . With the time passing their situation becomes precarious in many respects . I am appealing to the mathematical community to show support and help to my brother Silviu's family in their request for exit visas from Romania " .

A. R. A. PUBLICATIONS

The American Romanian Academy of Arts and Sciences has started publishing a series of books dedicated to the history , language , civilization and culture of the Romanian nation . Due to the generous financial help provided by the founder of A.R.A. , Monsignor Octavian Bârlea , the following volumes have been printed and are available to the interested persons/institutions :

- 1) OCTAVIAN BARLEA , România și Români ; Romania and the Romanians , 1977.
The text is integrally parallel in the Romanian and English languages .
The translation from Romanian into English is due to George C. Mureșan and Enea Moțiu . The book has 421 pages and 24 maps .
- 2) PAUL D. QUINLAN , Clash over Romania (British and American Policies toward Romania , 1938-1947) , 1977 .
The volume presents the diplomatic relations of England and the United States with Romania in the turbulent years between 1938 and 1947 .
- 3) MARIA MANOLIU-MANEA (Editor) , The Tragic Plight of a Border Area :
Bassarabia and Bucovina , 1983 .
The book contains a collection of studies and articles on Bessarabia and Bucovina , Romanian provinces annexed by Soviet Union .
- 4) VLAD GEORGESCU , Istoria Românilor (de la origini până în zilele noastre) , 1984 .
The first comprehensive and uncensored book on the History of Romanians published since 1944 .

These volumes can be ordered at the address : ARA Publications / 4310 Finley Ave
6 / LOS ANGELES CA 90027 .

LIBERTAS MATHEMATICA

Libertas Mathematica is the mathematical periodical of the American Romanian Academy of Arts and Sciences . It is published once a year , as a volume of 200 - 250 pages .

The contributions to Libertas Mathematica are requested by the editor , or they must be submitted by the members of the A.R.A. . Any paper submitted , if not accompanied by the report of a referee , will undergo a reviewing process .

Any correspondence regardin matters related to Libertas Mathematica must be addressed to the editor :

Professor C. Corduneanu
Department of Mathematics
University of Texas at Arlington
Box 19408
ARLINGTON , Texas 76019

The publication can be also ordered at the following address :

A.R.A. Publications
4310 Finley Avenue # 6
LOS ANGELES , CA 90027

Volumes I (1981) , II (1982) , III (1983) and IV (1984) are available . Volumes I , II , and III are priced \$ 35.00 each Institutional , and \$ 18.00 Individual subscribers . Volume IV is priced \$ 40.00 Institutional , and \$ 20.00 Individual Subscribers . Package Volumes I - IV can be ordered at the following rates : Institutional \$ 120.00 , Individual \$ 60.00 . Handling and postal fees are included in the prices shown above . Checks/Money orders must be made payable to the American Romanian Academy .

Subscriptions Agencies/Booksellers get a 20% discount from the Institutional rate .

Subscription for Volume V (1985) is \$ 40.00 Institutional , and \$ 20.00 for Individual subscribers .