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IN MEMORIAM - ACADEMICIAN MITROFAN CHOBAN

(05.01.1942 – 02.02.2021)

President of the Mathematical Society the Republic of Moldova (1999-2021). Vice-President of the Romanian Society of Applied and Industrial Mathematics (ROMAI) (1995-2021). President of Tiraspol State University (2002-2009). Founder of the school of general topology in the Republic of Moldova. Mathematics professor and researcher at Tiraspol State University for over 50 years. His original contributions to Mathematics can hardly be overestimated.

In memoriam - Academician Mitrofan Choban

Liubomir Chiriac, Dumitru Cozma

Mitrofan Cioban was born on January 5, 1942 in Copceac, Tighina county, Moldova (Romania) in the family of the farmers Mihail and Tecla Cioban. He was the fourth of the seven children. His parents encouraged Mitrofan to get as good an education as was possible at the time. They sent him to a boarding school in the neighboring village of Volontiri. Then, in 1959, he graduated from the high school of Volontiri village. After graduation, he worked for a year in the local agricultural organization.

At the age of 17 M. Cioban decided to become a mathematician

As he didn't speak Russian at the time, he had to give up his early dream of becoming a ship designer. At the age of 17 he decided to become a mathematician. In 1960 he was enrolled at Tiraspol State Pedagogical Institute (Moldova), at the Faculty of Physics and Mathematics within Tiraspol State Pedagogical Institute (Tiraspol State University), the first higher education institution in Moldova. Within the Faculty of Physics and Mathematics, the young Mitrofan meets great university professors such as: P. Osmatescu, C. Cozlovschi, M. Cozlovschi, Gh. Gleizer, I. Valuta, etc. Soon he joined a seminar in topology led by Professor P. Osmatescu. Thus, without initially realizing, the topology

Figure 1. Mitrofan Choban at the seminar in Topology led by Professor P. Osmatescu

seminar developed the young student's great passion for research in Topology for a lifetime.

The Topology seminar of Pavel Alexandrov

Having studied one year in Tiraspol, at the initiative of Professor Petru Osmatescu, Mitrofan Cioban and two other young people are sent to study at Moscow State University.

Ion Valuță, being at that time the doctoral student of Professor A. Kurosh, was invited by the Academician P.S. Alecsandrov to attend the conversation with M. Cioban. Professor I. Valuță remembers: "M. Cioban couldn't answer the question asked by P.S. Alexandrov." Either he didn't understand the question well enough, or he couldn't figure out how to answer in Russian. P.S. Alexandrov asked the young people to wait for the results as they would be announced very soon. I thought I should go out too, but he told me to stay. The academician tells me: "You have sent three students to university, but we will admit only two for study "I thanked him, but at the same time I dared to tell him that I had a confusion. He asked me what it was. The young man who did not answer anything, in my opinion, has special abilities for scientific research. P.S. Alexandrov's answer struck me: "If you say so, then we will accept everyone to study. We will always be able to expel the weakest in Mathematics. In a short time, the young mathematician demonstrated his creative potential in Mathematics.

Whithin the Moscow State University, M. Cioban started attending the Topology seminar of Academician Pavel Alexandrov. The scientific coordinator during his years of study at the University was Professor A.V. Arhangel 'skii.

Whithin the Topology seminar he did not hesitate to express his opinion when discussing scientific reports of venerable specialists. For example, it was believed that one result of the American mathematician Arthur Stone is final and not subject to further development. At the end of April 1964, while discussing A. Stone's results, unexpectedly student M. Cioban said that this was not the case. And, of course, many doubted that he was right. Nevertheless, M. Cioban did not back down, although many looked with a grin at the insolent student. Pavel Sergeevich turned out to be at his best - he invited Mitrofan Cioban to present his opinion on the development of the idea from the works of A. Stone in a week or, of course, to present his apology to everyone for his daring challenge. A week later, surprisingly to everyone, Cioban presented a wonderful scientific report which formed the basis of his famous scientific article on factorial mappings with separable preimages.

Profesor Stoyan Yordanov Nedev, Bulgaria, remembers: "Apparently, this report put M. Cioban on a special position - he was recognized as a highly qualified specialist in the field of Topology. He finished the third year of study with two excellent works which were soon published in the Journal Reports of the Academy of Sciences of the USSR.

Figure 2. Academician P. S. Alexandrov

Despite the fact that he did not know Russian, German and English, he perfectly knew almost all the works written in these languages over the past 70 years."

This was a generalization of one of A.H. Stone's results in the first paper Mitrofan had referred to. He has proved the following:

Theorem. *If $f : X \to Y$ is a quotient mapping of a metrizable space X onto a Tychonoff first-countable separable space Y, and all fibers under f are separable, then Y is metrizable.*

After this case, P.S. Aleksandrov has repeatedly said: if Mitrofan said this, then this is beyond doubt. P. S. Alexandrov recommended the first article of Mitrofan Cioban containing Theorem 1 for publication in Doklady AN SSSR, one of the most prestigious Soviet mathematical journals. It appeared in print in 1966, and it is his first publication. In fact, his first mathematical result had been obtained earlier, in November 1964, but it was published later.

Professor A.V. Arhagel'skii remembers "Mitrofan became a «star» in the main seminar on P.S. Alexandrov's General Topology. This made the seminar even more attractive to students, more popular with them. Mitrofan was active not only in Mathematics. He was

also a sportsman, participated in Romano-Greco wrestling competitions and won the title of the Champion of Moscow University. At the MSU the name Mitrofan was quite rare and therefore everyone called Mitrofan Cioban simply Mitrofan." It is necessary to mention

Figure 3. Professor A.V. Arhagel'skii

that student M. Cioban managed to obtain a series of beautiful results in Topology. He published a valuable paper in the prestigious journal Sovietic Mathematiceskij Doklady (see Sov. Math. Dokl). Thus, the publications of M. Cioban during the student period at Moskow University are:

(1) On the behavior of metrizability under quotient s-mappings. *Dokl. Akad. Nauk SSSR*, 166:3 (1966), 562–565.

(2) Behavior of metrizability under monotone quotient mappings. *Dokl. Akad. Nauk SSSR*, 168:3 (1966), 535–538.

(3) Behavior of metrizability under factorial s-mappings. Abstracts. Moscow. *International Congress of Mathematicians.* Section 8, M. (1966), 30.

(4) Certain metrization theorems for p-spaces, *Dokl. Akad. Nauk SSSR*, 173:6 (1967), 1270–1272.

(5) Finite-to-one open maps, *Dokl. Akad. Nauk SSSR*, 174:1 (1967), 41–44.

(6) Perfect mappings and spaces of countable type, *Vestnik Moskov. Univ. Ser. 1. Mat. Mekh.*, 1967, 6, 87–93.

He brilliantly graduated this Faculty in 1967. Here he attracted the attention of the famous and exigent teaching staff. He was recommended to Professor A.V. Arhangel'skii who marked his whole evolution as a mathematician, so that at the beginning of year 1967, he was privileged to study and work in the prestigious collective of researchers in Topology, brilliantly dominated by A.N. Kolmogorov's great personality. A year after his graduation from the faculty he has begun preparing his Doctor's Degree - the chosen specialty being Topology - at the State University "M. Lomonosov" of Moscow. In 1970 he graduated the Ph.D. in Mathematics with the thesis "Relations between classes of topological spaces", his adviser being Professor A.V. Arhangel'skii.

Professional career at Tiraspol State University

Academician Mitrofan Choban was a Mathematics professor and researcher at Tiraspol State University for over 50 years. Professor Mitrofan Choban started his didactic career at Tiraspol State University (Moldova) in 1970 and continuously worked in this university till 2021. He was in succession senior lecturer at the Department of Geometry and Didactics of Mathematics (1970-1974), associate professor at the Department of Geometry and Didactics of Mathematics (1975-1976), head of the Department of Geometry and Didactics of Mathematics (1976-1983), vice-rector of the University for science (1983-2002), president of the University (2002-2009) and head of the Department of Algebra, Geometry and Topology (2009-2021). Since 1981, Professor Mitrofan Choban was adviser for PhD Theses as well as for Dr. Sc. Theses. He advised 22 doctors of sciences and 4 Doctors Habilitatus in Mathematics. His teaching activity concerned the courses of "Geometry" as well as of "Set Theory and Topology". He also taught several special courses: Functional Spaces, Topological Groups, Algebraic Theory of Automata, Topological Universal Algebras, etc.

University of Tbilisi. Presentation of the doctoral thesis in Mathematics

On March 1978, the possibility arose that Mitrofan Choban could present his thesis at the Scientific Council of the University of Tbilisi. In order to carry out the expertise of the thesis, the head of the department, Academician George S. Ciogoshvili, proposed to hold a lecture course on the topic of the thesis and sent the thesis for review to Professor A.V. Arhangel'skii. Mitrofan Choban, assured that all was well and he arrived in Tbilisi in September 1978.

Mitrofan Cioban recalls: ”I asked Academician G. S. Ciogoshvili when the meeting of the department will take place. He told me to go to his house the next day at about 12 o'clock. I entered the spacious hall of the apartment. He proposed me to sit in an armchair. After a while he started telling me about the situation of my thesis. Going in front of me, from one corner of the room to the other, he said in Russian: “Now every doctoral dissertation requires a thorough analysis and expertise. A favorable opinion of the thesis is already from Professor A.V. Arhangel'skii. I recently submitted my dissertation to Professor Ponomarev. I personally intend to obtain favorable opinions from all well-known specialists in the field in the country and abroad, even from Michael in the USA. Only after this, the thesis will be examined at the department, as a result, a solid expertise of the thesis will be obtained." I asked if he would allow me to say something. With the Academician's permission, I said: “Dear George Severianovici. Thank you for your attention and for the great intentions you have for my modest research. But the following moments appear.

The first moment. Let's imagine that you have managed to get favorable opinions from all the respective specialists in the world. It does not matter that it will take at least ten years, about half a year for an opinion. In this case, before whom will I defend my thesis? Who will be the official opponent, because everyone approved the thesis positively? Who will be the profile organization? According to your “referendum,” everyone will be “pro.” How will my case be prefected in this case?

The second moment. Yes, why should my work please everyone? Everyone has their own tastes and interests. Let's say I'm an 18-year-old person who wants to get married. And there is a council of one hundred acsacals (in the East "acsacal" means an old, respected man with a rich life experience). The condition for me is that I can marry my chosen one, if and only if she is to the liking of all the acsacals. Please tell, "Will I be married until I'm 60?"

After the last words, I noticed that Academician Ciogoshvili wanted to say something. I was silent waiting. In a few moments he said, “Mitrofan. On my word of honor I no longer send your thesis to anyone. I will also write a positive opinion, and then I will recommend it for support”. He walked over to a closet and pulled out a bottle of vodka. He put it on the table. I opened the bag and took out a bottle of "Doina" cognac with a box of chocolates. I did a lot that day.

After lunch, everyone in the college already knew the content of our discussion. In the Dean's office there was Levan Jijiaşvili, chairman of the scientific council, Mirab, secretary of the council, dean of the faculty, a good friend of mine, Lazo Zambahidze. They asked me, "How did you dare to say that?". They knew that everything that

Academician Ciogoshvili told them was not questioned, but executed. They had feelings of wonder and envy.

Mitrofan Choban remembers ”Towards the New Year 1979 I received a telegram with the content: “Dear Mitrofan. Sincere good wishes, good health and many achievements. Your thesis with three excellent opinions was recommended for defense. Ciogoshvili ”. Life went on. Luckily for me, at the decisive moment, I didn't know all the Georgian customs.”

In 1980, he became Doctor Habilitatus in Mathematics with the thesis ”Set-valued mappings and their applications” (scientific consultant again being A.V. Arhangel'skii).

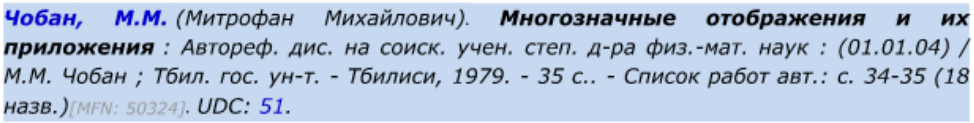
Чобан, М.М. (Митрофан Михайлович). **Многозначные отображения и их приложения** : Автореф. дис. на соиск. учен. степ. д-ра физ.-мат. наук : (01.01.04) / М.М. Чобан ; Тбил. гос. ун-т. - Тбилиси, 1979. - 35 с.. - Список работ авт.: с. 34-35 (18 назв.)[MFN: 50324]. UDC: 51.

Figure 4. From the archives of the University of Tbilisi

Scientific performances

In 1995, he was elected corresponding member of the Academy of Sciences of Moldova. Then, in 2000 he was elected Member of the Academy of Moldova, the highest forum of Moldavian spirituality and the highest recognition which a scholar may receive.

His scientific concerns group the following main directions: topology, topological algebra, descriptive set theory, functional analysis, topological optimization theory, measure theory, etc. He solved a number of well-known problems, formulated in the last 100 years by P.S. Alexandrov, A. V. Arhagel'skii, WW Comfort, F. Hausdorff, A. N. Kolmogorov, AI Maltsev, E. Michael, I. Namioka, B.A. Pasynkov, A. Pelczynski, R. Pheps, Z.Frolik, A. Stone, Z. Semadeni etc.

Mitrofan Choban published in academic journals from 1966 to 2021, mostly under the names of Choban or Čoban, and occasionally Cioban, Ciobanu, or Coban.

Thus, Professor Choban authored more than 300 papers and 20 books in many branches of Mathematics. He brought important contributions in: Hausdorff's problem on Borelian classes of sets; Alexandroff's problem about the structure of compact subsets of countable pseudocharacter in topological groups; Arhangel'skii's problem on the zero-dimensional representation of topological universal algebras; two Maltsev's problems on free topological universal algebras; two Michael's problems about G -sections of open mappings of compact spaces and of the k-coverings of open compact mappings of paracompact spaces; Phelps' problem about the structure of the set of points of Gateaux differentiability of convex functionals (with P.Kenderov and J.Revalski); Tichonoff's

problem about well-possedness of optimization problems in the Banach spaces of continuous functions (with P.Kenderov and J.Revalski); Confort's problem about Baire isomorphism of compact groups; Pasynkov's problem about Raikov completion of topological groups; Arhangel'skii's problem on metrizability of o-metrizable topological groups (with S.Nedev); Pelczinski's and Semadeni's problems about structure of Banach spaces of continuous functions on special compact subsets of quotient spaces of topological groups, etc.

He attended more than 100 scientific forums: 1) International mathematical congresses (Moscow, Zurich, Berlin), conferences (Moscow, New York, Baku, Sofia, Pitesti, Oradea, Sozopol, Bucuresti, Timisoara, Brasov, Chisinau, Novosibirsk, Tbilisi, Lecce, Iasi, Constanta, Sicilia, Livov, Varna, Borovets, Ohrid), 2) symposiums (Prague, Eger, Burgas, Genova, Marseille), 3) All-Union mathematical conferences and symposiums (Minsk, Moscow, Tiraspol, Chisinau, Livov, Sankt-Petersburg, Novosibirsk, Tobolsk, Tartu), 4) several national conferences. Having a great prestige in the world of Mathematics, Professor Mitrofan Choban has been invited to lecture by the well-known institutions: Institute of Mathematics and Informatics of the Academy of Science of Bulgaria, the Universities of Oradea, Tartu, Tbilisi, Tashkent, Tsukuba, Bishkek, North Bay (Canada). Moreover, he was invited as a speaker of the forums: V-th Prague Topol. Symp. (1981), Topological Colloq., Eger, Ungary (1983), International Moscow Topological Conference (1979), Soviet-Japan Topological Symposium, Niigata (1991), Workshop on General Topology and Geometric Topology, Tsukuba (1991), Workshop "Well-Posedness in Optimization, Margarita di Liguri, Italy (1991), International Conference on group theory, Timisoara, Romania (1991), Workshop "Well-Posedness in Stability and Optimization, Sozopol, Bulgaria (1993), Conferences on Applied and Industrial Mathematics, Romania (1994-2019), International Congress of Mathematical Society of South Europe, Borovets, Bulgaria (2003), International Conference "Geometric Topology, Discrete Geometry and Set Theory" in celebration of the centennial of Ljudmila V.Keldysh, Moscow (2004), International Conference "Quality in Formal and non Formal Education", Iasi, Romania (2010), Centennial Conference "Alexandru Myller" Mathematical Seminar", Iasi, Romania (2010), ICTA Islamabad, Pakistan (2011), CAIM - Conferences in Applied and Industrial Mathematics (1993-2019), 8-th International Conference on Applied Mathematics, Baia Mare, Romania (2011), etc..

Due to his prestige in the world of Mathematics he became: 1. Member of the Editorial Boards of: - Buletinul Academiei de Stiinte a Moldovei, Matematica, ROMAI Journal, Scientific Annals of Oradea University, Qusigroups and related systems; 2. President of the Mathematical Society of the Republic of Moldova (1999-2021); 3. Vice-President of

the Romanian Society of Applied and Industrial Mathematics (ROMAI) (1995-2021); 4. Member of the Moscow Mathematical Society; 5. Member of the Romanian Mathematical Society.

The special appreciation of his scientific work brought him several prizes, titles and orders, namely: prize of the All-Union Presidium of the ScientificTechnical Societies (1968); prize "Boris Glavan" of the Komsomol of Moldova, in Mathematics (1974); title Excellent of the High Education of the USSR (1980); order "Gloria Muncii" (Glory of Labor) of the Republic of Moldova (2000); State Prize of the Republic of Moldova (2002); Honorary citizen of the Stefan Voda county, Republic of Moldova (2005); prize "Academician Constantin Sibirschi" (2006); Doctor Honorius Causa of the Oradea University (2006); order "Honor" of the Republic of Moldova (2010); Medal "Dmitrie Cantemir" (2007), Medal "Nicolae Milescu Spataru" (2012); 70 years since the creation of the first Research Institutions and 55 of the ASM (2016); Researcher of the Year Award (2016); Order of the Republic of Moldova (2020).

Appreciations and recognitions from the academic world

- "For me there is no doubt that Professor Mitrofan M. Choban is a world-class scholar."
  Professor P. Kenderov, Members of Bulgarian Academy of Sciences

- "M.M. Choban is the most talented mathematician, with a great creative force."
  Professor A. Arhangel'skii, Moscow State University

- "The results of M.M. Choban gave rise to a whole series of publications in many countries ..."
  Academician A. Fomenko, Russia

- "Many experts in the field of Topology consider it an honor to carry out scientific research together with M. M. Choban" *Professor O. Lupanov and Professor V. Fedorchuk, Moscow State University*

- "Professor M.M. Choban is one of the most famous and recognized topologists in the world. Well known are his substantive research on the theory of multivalued mappings, topological algebras, descriptive theory of sets and function spaces, as well as their numerous applications to other areas of Mathematics."
  M. Abel, Professor of the Tartu University, President of the Estonian Mathematical Society.

- ”Mitrofan Choban is in the possession of incredible knowledge of the topological phenomena and strong and sophisticated techniques.”
  Professor G. Skordev, Corresponding Member of the Bulgarian Academy of Sciences

- "Academician Mitrofan Ciobanu is part of the elite of Moldovan scientists. His mathematical, educational and civic work is overwhelming in the field of Mathematics and has addressed new and difficult problems in Topology, Modern Algebra and its Applications.”
  Academician Radu Miron, ”Alexandru Ioan Cuza” University of Iasi.

- ”Academician Mitrofan Ciobanu was and remains a star in the world of mathematicians.”
  Professor Larenţiu Calmuţchi, Tiraspol State University

- "It is natural to ask: how does academician Mitrofan Cioban conceive Mathematics? Of course, he sees it in all its complexity, with one small exception - in no way does he perceive it as a form of snobbery. Who but him has tried all the facets: research, teaching, leadership. And every time he succeeded brilliantly, obtaining valuable results, being a talented professor and loved by students, leading Tiraspol State University and the Mathematical Society.”
  Corresponding member of the Moldovan Academy of Sciences,
  Professor C. Gaindric;
  Corresponding member of the Moldovan Academy of Sciences,
  Professor S. Cojocaru.

- "I have very many memories of his reign and I am very grateful to him for everything he has done for our countries, for ROMAI, for CAIMs and for me."
  Professor Adelina Georgescu, Romania.

- Who did Mitrofan Choban learn from?
  M. Choban: „Alexandr Arhangel’skii served me at that time as a model of professionalism and exemplary conduct ... Many other teachers ... contributed to my training as a specialist. For example, I learned from Vladimir Andrunachievich and Pavel Alexandrov the management of the organization of scientific research, from Otto Schmidt, Andrei Kolmogorov and Andrei Tikhonov - the organization of mathematical applications in various fields, from Anatol Mal’tsev and Alexandr Curosh - universal methods of examining things in depth and at the same time, simple and clear etc. ”

- "The founding of the school of General Topology belonged to Mitrofan Choban - a well-known figure in the mathematical sciences. His path to the high peaks of science has not been easy at all, but he has traveled through it well. "
  Academician Petru Soltan, Moldova

Figure 5. Academician P. Soltan: "Maestre, ce mai este nou în topologie?"

Professor M. Cioban was a very dear Teacher, respected by students and teachers as well, with a distinguished moral and scientific attitude, a leader with an amazing ability to solve everyone's problems. He was a star that illuminated the students' path and warmed our hearts and all those who knew him. Academician M. Cioban was an exceptional mathematician, but above all, he was an Extraordinary Man. His scientific work is an essential part of Moldova's contribution to Mathematics worldwide.

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