A man who had known his star in the sky. A homage to Professor Eugen Grebenikov (1932-2013)

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ABSTRACT. The main aim of this note is to present some data about the education, professional activity and scientific publications of Professor Eugen Grebenikov (1932-2013), a distinguished mathematician born in 1932 at Slobozia Mare, Ismail county, Romania (now in Republic of Moldova) who was educated and had worked for most of his life time in Moscow. Some author's personal recollections are also included.

1. A SHORT BIOGRAPHY

Professor Eugen Grebenikov died of a heart attack on 29 December 2013 in Moscow, three weeks before he would have been 82 years old.

He was born on January 20, 1932, in the village of Sloboziya Mare (Romania, now the Republic of Moldova) into the family of an orthodox priest and an elementary school teacher. In 1949, he graduated with honours from the Romanian Lyceum "Ion Vodă" at Cahul (Kakhuya, Moldova) and entered the Department of Astronomy at the Faculty of Mechanics and Mathematics of Moscow State University (MSU). He graduated MSU in 1954 and then, for the rest of his life, he activated at various academic institutions in Moscow. In the last ten years or so, he has been also associated with Moldova Technical University in Kishinev (Moldova) and Siedlce University (Poland).

E. Grebenikov (1932-2013)

He has been amazingly productive as a scientist and has obtained fundamental results in all areas of his main research interests: pure mathematical issues in the stability theory of solutions to differential equations and to applications in celestial mechanics, computer simulation, computer programming, etc.

In the last 20 years he took part in several scientific conferences and seminars in Russia or abroad, where he had given talks. He has published 25 books or monographs and about 200 articles in Russian and foreign journals. These clearly illustrate the wide range of his scientific interests. His contributions in these areas established him as a renowned expert in each of them.

In recent years, he has made important contributions to the restricted many-body theory. They were obtained via computer simulation and computer algebra languages and could not be derived by analytical methods.

As a sign of recognition, the International Astronomical Union and the specialists in celestial mechanics, where he began his scientific career, have named asteroid No. 4268 after Grebenikov.

He has been also awarded various Soviet distinctions and honorary doctorates (Doctor Honoris Causa) by some universities in Romania and Republic of Moldova: "Babeş-Bolyai" University of Cluj-Napoca (1993), Moldova Technical University in Kishinev, "Gheorghe Asachi" Technical University of Jassy, "Vasile Alecsandri" University of Bacău and "Bogdan Petriceicu Haşdeu" University in Cahul (2011).

He has been elected as Honorary Member of the Modova Academy of Sciences in 1992. The same institution has awarded him the prize "Acad. Constantin Sibirschi" in 2011.

E. Grebenicov left three sons: Andrei, and the twins Alexandru and Victor and five grandchildren, 4 boys and a girl. His elder son, Andrei, graduated Geology at Lomonosov University in Moscow, while the twins graduated Faculty of Mathematics and Mechanics.

2. Scientific activity. Selective list of papers

For this section, we capture a consistent excerpt from the authoritative voice of M. K. Kerimov [5].

"In 1954, E. Grebenikov graduated with honours MSU (Moscow State University). While a student, Grebenikov did research in celestial mechanics under notable MSU Professors N. D. Moiseev and G. N. Duboshin. After graduation, he continued his studies as a graduate student at MSU under the supervision of Moiseev, who had great influence on Grebenikov's early scientific career.

In 1957, Grebenikov completed his graduate studies and defended at MSU his candidate's dissertation in astronomy entitled *Analytical Theory of the Motion of Saturn's Eighth Moon Iapetus*. Due to his active participation in MSU seminars on celestial mechanics and the theory of ordinary differential equations, Grebenikov's major research interests in those years were focused on the analytical and qualitative theory of ordinary differential equations and their applications to nonlinear mechanics, in particular, to celestial space dynamics and the theory of nonlinear oscillations. In his first publications, Grebenikov demonstrated the effectiveness of Hill's analytical method as applied to the dynamics of natural and artificial satellites orbiting with large inclinations relative to the ecliptic plane and the planets' equator plane.

In 1967, Grebenikov defended his doctoral dissertation *Qualitative Studies of Differential Equations in Celestial Mechanics*, in which he was the first to substantiate the well-known Krylov-Bogolyubov method as applied to resonance multifrequency systems of differential equations with slow and fast phase variables. For such systems, he developed a general analytical perturbation theory (up to an arbitrary order with respect to a small parameter) and devised an analytical integration method for infinite systems of partial differential equations as applied to the determination of the Krylov-Bogolyubov transformation functions. For multifrequency systems, he designed an optimal choice algorithm for

determining unknown functions appearing in high-order averaged systems. These methods were designed for resonance systems of differential equations, which involve small denominators - the most substantial obstacle to the application of the Krylov-Bogolyubov method.

Grebenikov proposed and justified the new idea of developing asymptotic methods that minimize the deviations of solutions to averaged equations from those to the original equations. For this purpose, he used the stepwise correction of initial conditions combined with the principle of nonlinear multifrequency systems given on multidimensional tori. Following this approach, Grebenikov and his students examined new dynamic aspects of well-known problems, such as the restricted three(and more)-body problem with various resonances; resonance Hamiltonian systems; the motion of a geostationary satellite; problems in high- energy physics (the dynamics of charged beams in accelerators); and mathematical modeling in biology, geology, and other disciplines.

During the last decade, Grebenikov and his followers have been successfully developing a mathematical area that can be called Lagrange-Wintner homographic dynamics. Due to new information technologies, in particular, new computer algebra systems (such as Mathematica, Maple, etc.), they found new multi-parameter classes of exact solutions to the Newtonian many-body problem such as exact Lagrangian and Euler solutions to the differential equations in the Newtonian three-body problem. The objects of study are new gravitation models in celestial mechanics and space dynamics with complete and incomplete geometric and dynamic symmetries.

Continuing Lagrange and Wintner's studies in the theory of homographic three-body solutions, Grebenikov formulated necessary and sufficient conditions for the existence of homographic solutions to the Newtonian many-body problem with an arbitrary finite number of bodies. Due to these results, he concluded that the Trapezium cluster in the Orion Nebula is not a homographic solution to the Newtonian four-body problem; hence, its trapezoidal shape cannot be conserved.

Grebenikov proposed a new dynamic model of the restricted many-body problem ($n > 3$) that studies the motion of a passive mass in the gravitational field generated by a large number of bodies whose trajectories are homographic curves. For the restricted many-body problem, he proved a theorem on the existence of a first integral similar to the Jacobi first integral in the restricted three-body problem. Together with his students, Grebenikov developed effective computer methods for linearizing Hamiltonian systems in the neighbourhood of any stationary solution.

Mathematica-based software packages were developed for the symbol (not numerical) normalization of Hamiltonians in the neighbourhood of any stationary solution. In other words, effective software tools were designed for one of the most complicated problems in qualitative celes- tial mechanics and space dynamics - the Lyapunov stability of stationary solutions to the restricted many- body problem. These studies were based on results obtained in KAM theory (the theory of the existence of conventional periodic solutions to multidimensional Hamiltonian systems on multidimensional tori named after Kolmogorov, Arnold, and Moser).

Grebenikov published a series of works on computational mathematics concerning the numerical solution of differential, integral, and other functional equations. Some of his articles are devoted to the operation of com- puters, computer systems, programming languages, etc. Together with his students and colleagues, Grebenikov has published 28

monographs and more than 200 scientific papers. He has participated in many scientific conferences in our country and abroad. He was a member of the Program Committee of the annual International Workshop on Computer Algebra in Scientific Computing (CASC), which was held in different countries. For his great achievements, Grebenikov won the State Prize of the USSR in 1971. He was also awarded the Prize of the USSR Council of Ministers in 1983 and the Academician Krylov Prize of the Ukrainian Academy of Sciences in 1999. Professor Grebenikov is a full member of the Academy of Nonlinear Sciences, an honorary member of the Academy of Sciences of the Republic of Moldova, and an honorary doctor of four foreign universities.

Simultaneously with his intensive scientific activities, Grebenikov participates in training young scientists at different levels. In his student and postgraduate years, he taught mathematics at evening schools in the Krasnopresnenskii District of Moscow. Starting in 1957, after completing his graduate studies, he taught at the Faculty of Mechanics and Mathematics and at the Faculty of Physics of MSU. Later, he headed the Department of Mathematical Analysis at the Peoples' Friendship University of Russia, worked as a professor of the Department of Cybernetics at the Moscow State Institute of Electronics and Mathematics (Technical University), headed the Department of Algebra and Analysis at the Moscow State Aviation Institute (Technical University), served as a professor of the Department of Higher Mathematics at the Engineering University of the Republic of Moldova, and headed the Department of Mathematical Analysis at the University of Podlasie (Siedlce, Poland).

Over 50 years of his activity in science and science management, Grebenikov has trained numerous highly skilled professionals. Over the last five years, he supervised four candidate's and two doctoral dissertations. His students do research and teach in Armenia, Byelorussia, Israel, Kazakhstan, Mexico, the Republic of Moldova, Poland, Romania, and the USA.

In various years, Grebenikov held various high positions associated with his science management activities. In 1969-1978, he headed the Department of Mathematics at the Institute of Theoretical and Experimental Physics of the USSR State Committee on Atomic Energy. In 1978-1988, he was director of the MSU Research Computer Centre. In 1988-1997, he was a department head at the Institute of Problems of Cybernetics of the Russian Academy of Sciences and worked as deputy director at the Institute for High-Performance Computer Systems of the Russian Academy of Sciences. After this institute was disbanded, Grebenikov, together with his team, was transferred to the Computing Center of the Russian Academy of Sciences, where he headed the Department of Nonlinear Analysis Methods in 1997. "

The list of publications is mainly taken from the same well documented article by M. K. Kerimov [5] and also from MathScinet.

BOOKS AND MONOGRAPHS

1. *Handbook of Mathematics for Entrants to Engineering and Physics University* (MTILP, Moscow, 1960) [in Russian].
2. *Integral Calculus: Textbook* (Ross. Univ. Druzhby Narodov, Moscow, 1964) [in Russian] (with K. G. Danilov and P. V. Shcheglov).
3. *Qualitative Studies of Differential Equations in Celestial Mechanics*. Doctoral Dissertation in Mathematics and Physics (MGU, Moscow, 1967).
4. *New Qualitative Methods in Celestial Mechanics* (Nauka, Moscow, 1971) [in Russian] (with Yu. A. Ryabov).

5. *Handbook of Celestial Mechanics and Astrodynamics* (Nauka, Moscow, 1971) [in Russian] (with V. K. Abalkin, etc.).
6. *Lectures on the Theory of Resonance Systems*, Proceedings of IX All-Union School on Differential Equations (Naukova Dumka, Kiev, 1973).
7. *Handbook of Celestial Mechanics and Astrodynamics*, 2nd (revised and extended) edition (Nauka, Moscow, 1976) [in Russian] (with V. K. Abalkin, etc.).
8. *Lectures on the Three-Body Problem: Nonlinear Oscillations* (Naukova Dumka, Kiev, 1976) [in Russian].
9. *Resonances and Small Denominators in Celestial Mechanics* (Nauka, Moscow, 1978) [in Russian] (with Yu. A. Ryabov).
10. *Constructive Methods for Analysis of Nonlinear Systems* (Nauka, Moscow, 1979) [in Russian] (with Yu. A. Ryabov).
11. *Metoda Usrednienia w Meshanice Nielinioej* (PNR, Warsaw, 1982) [in Polish] (with Yu. Ryabov).
12. *Nicolaus Copernicus*, 2nd. ed. (Nauka, Moscow, 1973) [in Russian].
13. *Constructive Methods in the Analysis of Nonlinear Systems* (Mir, Moscow, 1983) (with Yu. Ryabov).
14. *Ordinary Differential Equations: Notes on the Development of Mathematics in the USSR* (Naukova Dumka, Kiev, 1983) [in Russian].
15. *Mathematical Modeling in Nonlinear Mechanics* (Nauka, Moscow, 1984) [in Russian].
16. *Search for and Discovery of Planets*, 2nd. ed. (Nauka, Moscow, 1975) [in Russian] (with Yu. A. Ryabov).
17. *The Three-Body Problem in Celestial Mechanics* (Mosk. Gos. Univ., Moscow, 1985) [in Russian] (with V. G. Golubev).
18. *Numerical-Analytical Research Methods for Regularly Perturbed Multifrequency Systems* (Mosk. Gos. Univ., Moscow, 1986) [in Russian] (with M. N. Kiosa and S. V. Mironov).
19. *Averaging Method in Applications* (Nauka, Moscow, 1986) [in Russian].
20. *Introduction to the Theory of Resonance Systems* (Mosk. Gos. Univ., Moscow, 1987) [in Russian].
21. *Averaging Method in the Study of Resonance Systems of Differential Equations* (Nauka, Moscow, 1992) [in Rus- sian] (with Yu. A. Mitropolsky).
22. *Introduction to Resonance Analytical Dynamics* (Yanus-K, Moscow, 1999) [in Russian] (with Yu. A. Mitropolsky and Yu. A. Ryabov).
23. *Computer Algebra Methods as Applied the Many-Body Problem* (Ross. Univ. Druzhby Narodov, Moscow, 2001; 2002, 2nd ed.) [in Russian] (with D. Kozak-Skovorodkina and M. Jakubiak).
24. *Asymptotic Methods in Resonance Analytical Dynamics* (Boca Raton, London, 2004) (with Yu. A. Mitropolsky and Yu. A. Ryabov).

SELECTED LIST OF ARTICLES

1. *General Solution to the Problem of Satellite Motion in the Earth's Normal Gravity Field*, in Artificial Satellites (Akad. Nauk SSSR, Moscow, 1961), No. 8, pp. 64–71 [in Russian] (with E. P. Aksenov and V. G. Demin).
2. *Issues Concerning Justification of Averaging Schemes in Celestial Mechanics*, Tr. Inst. Teor. Astron. Akad. Nauk SSSR 11 (5), 40 (1968).
3. *Estimates for the Averaging Method As Applied to Multifrequency Systems of Ordinary Differential Equations*, Differ. Uravn. 4, 459–473 (1968).

4. *On the Reducibility of Multifrequency Systems of Differential Equations with Summable Series*, Differ. Uravn. 6, 403–411 (1970) (with F. K. Vaskan).

5. *Generalized Problem of Two Stationary Centers and Its Application to the Theory of Motion of Artificial Satellites*, Astron. Zh. 40, 363–372 (1963) (with E. P. Aksenov and V. G. Demin).

6. *On the Averaging of Systems over a Time Interval of Order $O(\frac{1}{\epsilon\alpha}), \alpha \geq 1$*, Izv. Akad. Nauk Mold. SSR, Ser. Fiz. Tekh. Mat. Nauk, No. 3, 7–16 (1971) (with I. M. Vul'pe and D. K. Likaya).

7. *A Numerical Method for Verifying Hypotheses on the Structure of Solutions to Differential Equations*, Zh. Vychisl. Mat. Mat. Fiz. 14, 1212–1220 (1974) (with M. N. Kiosa).

8. *On the Existence of Asymptotic Solutions to a Class Partial Differential Equations*, Differ. Uravn. 11, 505–511 (1975) (with R. Sh. Shakibaliev).

9. Preprint, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1972) (with A. A. Morozova).

10. Preprint No. 126, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1976) (with N. I. Popova).

11. *Some Strongly Perturbed Problems in Nonlinear Mechanics*, in Problems in Analytical Mechanics, Stability Theory, and Control (Nauka, Moscow, 1975), pp. 38–42 [in Russian] (with E. P. Aksenov, etc.).

12. *A Numerical Experiment Concerning Suboptimal Stabilization of Spiral Perturbations*, Sb. Rabot Vychisl. Tsen- tra Mosk. Gos. Univ., No. 37, 4–12 (1982) (with M. L. Kiosa and A. I. Moroz).

13. *The Lagrange–Sharpi Method in the Restricted Three-Body Problem*, Differ. Uravn. 9, 2041–2047 (1973) (with M. L. Kiosa).

14. Preprint No. 56, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1973) (with M. L. Kiosa).

15. *The Existence Conditions for Equilibriums in a Restricted Circular Many-Body Problem*, Tr. Mat. Inst. im. V. A. Steklova, Ross. Akad. Nauk 223, 163–165 (1998) (with L. Ya. Gadomskii).

16. Preprint No. 64, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1974).

17. Preprint No. 10, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1976) (with T. S. Efremova).

18. Preprint No. 22, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1976) (with N. F. Avdeev, etc.).

19. Preprint No. 23, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1976) (with S. G. Zhuravlev and Yu. A. Ryabov).

20. Preprint No. 140, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1976) (with T. S. Efremova).

21. Preprint No. 68, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1976) (with M. N. Kiosa).

22. Preprint No. 54, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1977) (with B. Tynysbaev).

23. Preprint No. 100, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1977) (with K. A. Pupkov and E. B. Frolov).

24. Preprint No. 101, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1977) (with K. A. Pupkov and E. B. Frolov).

25. Preprint No. 130, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1977) (with L. V. Dobroly- ubov, etc.).

26. Preprint No. 101, ITEF (Institute of Theoretical and Experimental Physics, Moscow, 1978) (with Yu. P. Arpishkin, etc.).

27. *On Generators of New Perturbation Methods for Regular Systems of Differential Equations*, Zh. Vychisl. Mat. Mat. Fiz. 37, 559–565 (1997).

28. *Existence of the Jacobi Integral of Differential Equations in the Restricted Circular Newtonian Many-Body Problem*, Mat. Model. 10 (6), 118–122 (1998).

29. *Existence of Exact Symmetric Solutions in the Planar Newtonian Many-Body Problem*, Mat. Model. 10 (8), 74–80 (1998).

30. *New Classes of Exact Solutions in the Many-Body Problem That Are Mutually Attracted According to an Arbitrary Law Depending on the Relative Distances*, Ukr. Mat. Zh. 50, 329–337 (1998) (with L. Ya. Gadomskii, etc.).

31. *Stability of Homographic Solutions to Certain Hamiltonian Systems in Celestial Dynamics*, in Proceedings of the Institute of Mathematics, National Academy of Sciences of Belarus (Minsk, 2000), Vol. 6, pp. 61–64 [in Russian] (with D. Kozak-Skovorodkina and M. Jakubiak).

32. *Two New Dynamical Models in Celestial Mechanics*, Romanian Astron. J. 7 (1), 13–19 (1998).

33. *On New Applications of the Arnold–Moser Theorem in the Many-Body Problem*, Nonlinear Oscillations 4 (4), 35–49 (2001) (with D. Kozak-Skovorodkina and M. Jakubiak).

34. *Application of Mathematica to the Analysis of Wintner's Gravity Hypothesis*, in Application of Mathematica and Maple to Scientific Research (Vychisl. Tsentr Ross. Akad. Nauk, Moscow, 2001), pp. 78–98 [in Russian] (with A. E. Grebenikov).

35. *Determination of the Boundaries between the Domains of Stability and Instability for the Hills Equation*, Nonlinear Oscillation 6 (1), 42–51 (2003) (with A. N. Prokopenya).

36. *Arnold-Moser Theorem and Stability Problem in New Models of Celestial Dynamics*, Zh. Vychisl. Mat. Mat. Fiz. 43, 203–211 (2003) (with D. Kozak-Skovorodkina and M. Jakubiak).

37. *Stability Theorems for Stationary Solutions to the Restricted Ten-Body Problem in the Third-Order Resonance Case*, in Simulation and Analysis in Decision Making (Vychisl. Tsentr Ross. Akad. Nauk, Moscow, 2004), pp. 3– 15 [in Russian] (with N. I. Zemtsova and E. V. Iskhanov).

38. *On the Existence of New Class of Exact Solutions in the Planar Newtonian Many-Body Problem*, in Simulation and Analysis in Decision Making (Vychisl. Tsentr Ross. Akad. Nauk, Moscow, 2004), pp. 39–56 [in Russian] (with A. N. Prokopenya).

39. *Symbol Computations in Stability Analysis of Differential Equations with Periodic Coefficients*, in Theoretical and Applied Problems in Nonlinear Analysis (Vychisl. Tsentr Ross. Akad. Nauk, Moscow, 2005), pp. 3–25 [in Russian] (with A. N. Prokopenya).

40. *KAM Theory and Homographic Dynamics*, in Theoretical and Applied Problems in Nonlinear Analysis (Vychisl. Tsentr Ross. Akad. Nauk, Moscow, 2005), p. 26–45 [in Russian] (with N. I. Zemtsova).

41. *Investigation of the Stability Problem for the Critical Cases of the Newtonian Many-Body Problem*, Comput. Algebra Sci. Comput., Lett. Notes Comput. Sci. (Springer-Verlag, Berlin, 2005), Vol. 3718, pp. 236–243 (with D. Kozak-Skovorodkina and M. Jakubiak).

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43. *Animation of Graphic Data in Restricted Newtonian Many-Body Problems*, in Reports on Applied Mathematics (Vychisl. Tsentr Ross. Akad. Nauk, Moscow, 2006) [in Russian] (with L. Ya. Gadomskii etc.).

44. *Numerical Analysis of Stability Domains of Stationary Solutions to the Restricted Three-Body Problem*, in Theoretical and Applied Problems in Nonlinear Analysis (Vychisl. Tsentr Ross. Akad. Nauk, Moscow, 2004), pp. 50– 64 [in Russian] (with D. Kozak-Skovorodkina).

45. *Existence and Instability of Diamond-Like Central Configurations in the Sense of Wintner for the Newtonian Nine-Body Model*, in Theoretical and Applied Problems in Nonlinear Analysis (Vychisl. Tsentr Ross. Akad. Nauk, Moscow, 2006), pp. 65–76 [in Russian] (with D. M. Diarova and N. I. Zemtsova).

46. *Algorithm for Inverting the First Integrals of Differential Equations in the Three-Body Problem Averaged According to N.D. Moiseev's Scheme*, in Numerical Methods for Solving Boundary Value Problems for Differential Equations (Moscow, 1986), pp. 3–10 [in Russian] (with P. Ts. Golitsyan).

SOME RECENTLY PUBLISHED ARTICLES

1. Grebenikov, E. A. *On a mathematical problem in the theory of nonlinear oscillations*. (Russian) Ukrain. Mat. Zh. 60 (2008), no. 1, 56–62; translation in Ukrainian Math. J. 60 (2008), no. 1, 59–65

2. Grebenikov, E. A. *Two problems relating to the qualitative theory of Hamiltonian systems*. (Russian) Bul. Acad. Stiinte Repub. Mold. Mat. 2008, no. 1, 131–138.

3. Grebenikov, E. A.; Zemtsova, N. I. *On the correctness of the dynamic Jacobi model*. (Russian) Theoretical and applied problems of nonlinear analysis (Russian), 176–186, Ross. Akad. Nauk, Vychisl. Tsentr im. A. A. Dorodnitsyna, Moscow, 2009

4. Amel'kin, V. V.; Gaishun, I. V.; Grebenikov, E. A.; et al.; *Aleksandr Andreevich Shestakov (on the occasion of his ninetieth birthday)*. (Russian) Differ. Uravn. 46 (2010), no. 1, 9–15; translation in Differ. Equ. 46 (2010), no. 1, 8–16

5. Grebenikov, E. A.; Diarova, D. M.; Zemtsova, N. I. *Existence of homographic solutions in non-Newtonian dynamics*. "Alexandru Myller" Mathematical Seminar, 124–129, AIP Conf. Proc., 1329, Amer. Inst. Phys., Melville, NY, 2011

3. How I have met Professor E. Grebenikov

It was a rare priviledge for me to meet Professor Grebenikov, in 1993, during his first visit in his native country, Romania. The story is as follows.

On 10th of December, 1993, I defended my PhD thesis in Mathematics (Nonlinear Analysis) at "Babeş-Bolyai" University in Cluj-Napoca, at Faculty of Mathematics and Informatics, under the supervision of Professor Ioan A. Rus. At that time, the ceremony of defending the PhD thesis was a very important event for the academic community, because, for a long period of time, the Ministry of Education approved only very few positions for PhD students in mathematics at the Faculty of Mathematics and Informatics in Cluj-Napoca.

Usually, almost all members of the academic community were attending such an event (nowadays, as the number of PhD students continuously grew, there is no more the same high interest for this kind of ceremonies).

As Professor Grebenikov was at that time visiting "Babeş-Bolyai" University in Cluj-Napoca, with the occasion of the awarding of a Honorary Doctorate to him, he was naturally one of the auditors during the ceremony of defending my PhD thesis.

At that time, it was the custom (that still exists in Romania) to invite the members of the evaluation commitee and some selected auditors to a restaurant, to celebrate the fresh awarded doctorate. In the list for the restaurant I have had a consistent number of invitees, most of them being my colleagues from the Department of Mathematics and Informatics (at that time, called Catedra de Matematică şi Informatică), from University of Baia Mare.

Before the entire group of invitees left for the restaurant, my PhD supervisor, Professor Rus, came to me and asked privately: "Vasile, look, there is a Professor from Moscow in visit here and, if you do not mind, I would like to invite him to join us for the lunch to the restaurant. He is not alone, Professor Pal, his former classmate in Moscow, is also accompanying him".

I agreed without any hesitation, because I was really happy with my scientific accomplishment and so I wanted to share the joy with as many people as possible. This decision, nowadays judged, falls under the meaning of a Romanian saying "Unde merge mia, merge şi suta" (which could be translated into English as "In for a PENNY, in for a pound").

Anyway, during the pleasant and very long lasting lunch-dinner we have had there, Professor Grebenikov sat next to our Head of Department at that time, the distinguished Associate Professor Maria Sânziana Pop, and to other colleagues of mine from the Department.

He was particularly interested to know more about Baia Mare and Maramureş, a region he recalled from his school time, from the lessons on Romania's geography, since at that time his native town, Slobozia Mare, and Bessarabia itself were parts of Romania.

Naturally, Maria Sânziana Pop invited him to University of Baia Mare and, fortunately, this visit was held six month later, in May 1994, see the content of Section 4.

During his visit in Baia Mare he has been accompanied by his wife, Valentina, and his oldest grandson, Andrei.

We organised a full day excursion by car in the historical part of Maramureş (Maramureş short tour, the driver has been my younger colleague of Department Ioana Taşcu).

We have had a very pleasant weather and, we have visited some wooden churches on Mara Valley, the Museum of Maramureş Village Sighetu Marmaţiei and the Joy Cemetery (Cimitirul Vesel) in Săpânţa. I do remember the picnic we have had somewhere between Săpânţa and Negreşti-Oaş. We sat all on the fresh green grass and he told us much of the story of his life trip from a Soviet Moldavian town to Moscow.

What impressed me from the beginning when hearing his life story abstract, was his perfect Romanian language. For, he was spoken without any hesitation in a fluent Romanian with sweet Moldavian accent, despite the fact he lived more than 50 years in Moscow, his wife was a Russian lady and the language they used to speak in the family was always Russian.

I asked him at a certain moment about this fact and he told us immediately the secret of keeping such a perfect Romanian language.

His mother has been a primary school teacher and, when he decided to leave for Moscow, in 1949, she asked him to promise he will write her a letter each week to report on his activity, personal events etc. He kept his promise until his mother's death.

Amongst the many stories he told us with that occasion, I would like to briefly sketch one of them.

It was in the seventieth or eighties, I do not remember exactly. Due to his Russian name (one of his paternal grandfathers has been a Russian orthodox priest) he succeeded to became a member of the Communist Party and to occupy some important administration positions during the Soviet times, if I am no wrong, to the Institute of Super Computers, where most of the activity has been dedicated to cosmic research.

He told us that he was extraordinary well paid in that period such that his wife could fully dedicate to their children. He was given a car and a personal driver, as well as the other usual privileges, like a country cottage outside Moscow (Datcha). But he has been permanently followed and overseen by the KGB agents. He have had only one problem: at the moment he has been appointed in administration, he omitted to declare his relatives in Romania. And eventually, this created him later serious troubles with the KGB.

It happened that one of his cousins from Romania became politically important and at a certain moment had been included in the Romanian delegation to a Congress of Communist Women from all countries from the Soviet block, a congress that was held in Moscow.

It must be stressed on the fact that the two groups of his family, the one in Romania and the other one in the Soviet Moldova, have had no official contacts or ties after World War II. But in each family, they all knew they have relatives on the other bank of Prut river (which was the natural common border of Romania and Soviet Union and is now the common border of Romania and Republic of Moldova).

Already in Moscow, this lady was eager to know something about her cousin in Moscow and, if possible, meet him personally. So, she easily identified him in the telephone book and phoned him from a public telephone. Fortunately, he was at home and when the telephone rang and he have heard the words in Romanian "Alo ! I am ...., your cousin", he asked "Where are you just now ? I shall look for you." and immediately stopped the call. Fortunately, nothing about Romania has been mentioned during this short conversation.

At that moments following this call, he knew he will be asked by the KGB agents to report on the incident. Therefore, he could not sleep all the night. Next day, in his office, two KGB agents were waiting for him. But he has been by now well prepared for the meeting. He simply told them that it was someone from his relatives from Kishinev who called his phone but was probably looking for another person.

Fortunately, the incident has had no consequences for his administrative position...

I do remember a lot of other stories about his professional activity and life in Soviet Union but it is not space to include all here.

4. A man who knows his star in the sky. Interview with E. Grebenikov (1994)

(Text originally published in the local newspaper *Glasul Maramureşului* [1]. It has been translated from Romanian by the author)

Professor Grebenikov have returned recently to Romania in order to attend the International Congress "România şi Românii"(Romania and the Romanians), that was held in Sinaia, in the period 24-27 May. Taking this opportunity, he previously visited University of Baia Mare, in the period 14-18 May, in response to an invitation from December 1993, see **Section 4. How I met E. Grebenikov.**

During his visit in Baia Mare, Professor Grebenikov gave an extended lecture on *Mathematical modelling of essentially nonlinear phenomena* in the framework of the Scientific Seminar of the Chair of Mathematics and Informatics (Catedra de Matematică şi Informatică)

from University of Baia Mare, in front of the students from the programme Mathematics and Physics and academic staff.

Taking this opportunity, I asked Professor Grebenikov to accept to be interviewed exclusively for the local newspaper Glasul Maramureşului, which actually was the only newspaper announcing his visit in Baia Mare.

Question. *Dear Professor Grebenikov, please tell us, what are your thoughts when coming back to Romania, your birth country, one year after your first visit, in 1993, when you was awarded a Honorary Doctorate (Doctor Honoris Causa) by "Babeş-Bolyai" University in Cluj-Napoca ?*

Answer. I am born in Romania, on the 20th of January 1932, in the town Slobozia Mare, near the city Galaţi, but situated on the opposite bank of the Prut river, where my father was a priest, while my mother, born in Galaţi, situated on the right hand side bank of the Prut river, was a primary school teacher (învăţătoare).

As I have confessed in November 1993 in Cluj-Napoca (i.e., during the Doctor *Honoris Causa* awarding ceremony at "Babeş-Bolyai" University), I have lived long periods in my life when I simply could not imagine it will be possible one day to see again my birth country, where have lived as refugees some relatives from my father side, after Bessarabia became again part of Soviet Union: an uncle, an aunt and my grand mother, alongside all my relatives from my mother side.

So, any return in my country in an opportunity of great joy and happiness.

Question. *You are an internationally renown scientist and a member of the International Astronomical Union. Can you tell us how you reached Moscow ?*

Answer. I graduated the Moldavian High School in Cahul, at that time situated in Moldova Soviet Socialistic Republic, in 1949, and I applied for the State University in Kishinev. Do to the fact that I've got maximum grades at the entrance examination, I was told to go to Moscow, to study there. I have had very serious hesitations in doing so, because I did not speak Russian at that time. Eventually, after a while, I took this important step in my life. Thus, I became a student of the famous Lomonosov University in Moscow, at the Faculty of Mathematics and Mechanics.

Despite the fact that, in my first year of university studies, I practically did not understand almost all of what was taught there, I however graduated university, in 1954, with the distinction *Magna cum Laudae*. As a university student, I have got all the time excellent marks, being thus eligible for getting a scholarship, but I never benefited from it, because of my "origin". I got my PhD in 1957 at the same university.

Question. *Which are the mathematics fields you covered by your research work, during a period of more than 40 years of scientific activity ?*

Answer. A mathematician, like many other scientists, is simultaneously interested of many research topics. So, it is rather difficult to draw firm borders between these research interests for certain periods in my scientific activity.

But, if I restrict to my first 15 years of research work, I could say that the focus of my research activity has been on celestial dynamics. This was a period in which I was interested on the mathematical aspects of the problem of launching the first artificial satellites, in parallel to my teaching activity at Lomonosov University in Moscow.

In 1967 I have got my doctor docent title and became Professor at Lomonosov University in Moscow. I have to tell you that, as a reward for my scientific contributions to celestial dynamics, the International Astronomical Union have decided that a small star in the sky, the asteroid 4225, should be named after me.

Question. *I personally have had the privilege to attend two times your lectures on various problems of the mathematical modelling: first, in Cluj-Napoca, in 1993, and, very recently, in Baia Mare. How old are these research interests, that established you as the main specialist in Soviet Union (Russia), and amongst the best ones in the world ?*

Answer. The mathematical modelling in the study of nonlinear phenomena arising in the physics of nuclear reactors, astronomy and social sciences was the main topic of my research as well as of my research group that I have directed since 1969-1970. But, in the last years, I switched to the study of the mathematical problems in the designing of super computers and optic computers, a very important field of research in the development of the current science and technology.

Question. *Dear Professor Grebenikov, you are amongst the most important scientist from Republic of Moldova, despite the fact you live and work in Moscow. What can you tell us about the Romanian community in Moscow ?*

Answer. In 1949, 5 youngsters coming from Bessarabia have arrived for university studies in Moscow. We were in touch and helped each other all the time. Presently, our community, concentrated in the Cultural Association "Moldova" counts 5000 members. It is an official association, with cultural aims only, registered at the Council Town of Moscow. I am a member of its governance committee, together with the writer Ion Druță.

Naturally, our association could not avoid the political aspects. Some 20 years ago, one of its illegal aims was to form a government of Moldova and the union to Romania. For these reasons, one of its former leaders has been sent to prison, being condemned to 12 years. He has been liberated 6 years ago.

Question. *Which are your projects for the future ?*

Answer. At my age, my main aim is to help Romanian youngsters who want to study mathematics, regardless they are coming from the left bank or from the right bank of the Prut river, in the same manner I have done so far with people from Bessarabia.

Actually, after Moldova became an independent state, I was thinking seriously to move to Kishinev, where my brother lives, in order to directly help my co-nationals and thus contribute to the cultural reunion of Republic of Moldova and Romania. Because I believe in the reunion of all Romanians and, hence, I strongly believe that we must do all is up to our possibilities in order to unify, for the moment, the systems of education in the two Romanian states.

My conviction is that, the education and research in any country cannot ascend to top-level positions without a large opening and collaboration with specialists from other countries.

In this context, I would like to inform you that, as a result of this visit, we already signed an agreement between my university and University of Baia Mare. According to its stipulations, starting with the next academic year I shall invite to Moscow one or two members of the Department of Mathematics and Informatics from your university.

Concluding remark. *By wishing you good health and fruitful working energy, I am thanking you very much for the interview. We are waiting for your next visit to Baia Mare.*

5. THE LAST LETTER FROM E. GREBENIKOV

From the moment he visited Baia Mare, in 1994, I did not meet Professor Grebenikov ever, in spite of the fact that afterwards he has been invited for shorter or longer periods of time in different places and universities in Romania. But we were in contact by mail.

He usually wrote me classical letters, to which, I usually have answered by letters sent to him by electronic mail.

This is reason I include here the facsimile copy of the last letter I received from him (first three pages), which is unfortunately not dated but, from the facts related there, it can be deduced that it has been written sometimes in the spring of 2002, when he was 70 years old and still very active professionally.

In fact, we lost the last chance to meet each other in Iaşi, in 2010, on the occasion of the anniversary conference ″Centennial of the Mathematical Seminar Al. Miller″. Despite the fact we both attended this meeting, we did not meet because as he had left very soon, just after the opening ceremony.

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Multstimate, D-le profesor
Vasile Berinde

Cu plăcere sufletească vă prezint ultimile
două monografii ale mele (din păcate sunt edi-
tate în limba rusă) si materialele unei conferinte,
care e traditională si finantată de Ministerul
Educatiei al' Poloniei. Unele 'evenimente din viață?
1. Lucrez ultimii 5 ani la Universitatea din orasul
Siedlce (Polonia), sunt sef la catedra de análiză.
Paralel continuu să lucrez la Academia de Stiinte
a Rusiei la Centrul de Calcul (Вычислительный
Центр Российской Академии Наук им. А. А. До-
родницына), sef al departamentului de análiza
nelineară. Leafa la Moscova e 80 dolari pe
lună, în Polonia — 1000 dolari (pentru profe-
sori universitari de categoria superioară).
2. În acest timp doi polonezi au sustinut doc-
toratul în "ecuatiile differentiale" si sper, că
încă doi tineri 'din Polonia' vor sustine docto-
ratul în următorii doi ani.
3. Am relatii stiintifice excelente cu Politehica
din Miunhen '(Germania), care mă invită pe
contul lor la Conferintele annale CASC
(Computer algebra in scientific computations).
Următoarea v'a fi în Crimea (Ucraina) la

Figure 1. Facsimile of a letter from E. Grebenikov, pag. 1

sfârșitul lui august 2002, precedenta a avut loc la
Konstanz (Germania) în septembrie 2001. La această
conferință a participat și o româncă, Ioana Nicula,
absolventă a Universității din București, face
doctoratul în Spania.

4. La conferința anuală (ACA-2002, Applications of
Computer algebra), care va avea loc la
25-28 iunie 2002 în Grecia, am cu doi colegi
pagina-internet pentru secțiunea noastră.
Ar fi minunat ca compatrioții noștri să
participe la așa conferințe.

5. La 28.11-1.12 2001 am participat la Congresul
al V-lea al românilor de pretutindeni, la
Băile Herculane. La 1 decembrie am fost
la Alba Iulia - poate una din cele mai fe-
ricite zile din viața mea. Am avut o
mare fericire să simt cu toate fibrele
sufletului Ziua Unirii a poporului nostru.
Sper că va fi și Ziua reunirii Basarabiei
cu Patria-Mamă în timpul vieții mele,
care continuă deacum 70 ani.

6. Nepotul meu cel mare, Andrei tot timpul își amin-
tește de Baia Mare. Are 17 ani, e mai înalt decât
mine, termină clasa XI și știe la perfecție lim-
ba poloneza. Amul recent termină liceul la
Moscova și va încerca să devină student. Absolut

FIGURE 2. Facsimile of a letter from E. Grebenikov, pag. 2

toti tinerii din Rusia fug de armata, în care
e'un dezastru nemărginit. Soția, d-na Valentina
se chinuiește al 22-lea an cu diabeta. Slava
Domnului că acum are insulina suedeză, și
daneză - cea mai bună insulină.

7. Cu ocazia a 70-ani la Academia Rusă a avut
loc o mică festivitate, unde au participat
multi elevi-doctori ai mei (din 42, 20 sunt
români), și unul die ei, rectorul Universității
de Stat din orașul Atârau (Cazahstan),
prof. Sachibaliev mi-a făcut un cadou, care nici
nu-mi putea închipui: un mânz, care acum
crește în stepa Cazahstanului, și peste un
an, dacă î-l voi putea transporta la Moscova
va costa cam 20000 dolari. Mă gândesc cum
să-l aduc la Slobozia-Mare și să-l fac
cadou al baștinei mele.

    Acestea sunt unele noutăți din viața mea.
M'as bucura de toate noutățile, care le voi
primi dela D-voastră.

    Salutări si cele mai sincere urări pentru
un viitor mai frumos și mai fericit pentru
familia D-voastră, pentru d-l profesor
Iulian Coroian, pentru d-na Lidia Cozma, pentru

FIGURE 3. Facsimile of a letter from E. Grebenikov, pag. 3

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