

# Professional Profile

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### Teaching

My teaching career started in 1990, when I joined the “Politehnica” University of Timișoara as Assistant Professor at the Hydraulic Machinery Department, after working for two years as mechanical engineer in a thermoelectric power plant. I followed all the steps in a regular academic career, as Lecturer, Associate Professor, full Professor (since 2003) and PhD advisor (since 2007), within the same department.

The main focus of my teaching activities was on fluid mechanics and its applications. I started with the general course in Fluid Mechanics and Hydraulic Machines, which is part of the core curriculum in mechanical engineering. For the past 4 years I am teaching this course in English, for civil engineering students.

Besides this general course, I developed several courses for bachelor and master degrees, as follows. Since early '90s I focused my specialized teaching activities on numerical simulations for incompressible flows. The basic mathematical models for theoretical hydrodynamics (flow of incompressible and inviscid fluids) and the associated variational formulations leading to the finite element algorithms, were the backbone for both course materials and computer codes development for lab works and project applications. In particular, I was developed a finite element code for flows in hydrofoil cascades (the basic problem for turbomachinery design and analysis), with a graphical interface, which is used for more than ten years in courses such as Numerical Methods in Hydrodynamics, or Design and Optimization of Hydraulic Machines. My textbooks on "Topics in Fluid Mechanics and Numerical Methods" (1991) or "Numerical Fluid Mechanics" (2003) present not only the theoretical issues, but also include details on code development and implementation of various numerical methods, such that the reader can go beyond the user stage into the developer stage. In addition to the in-house codes I am teaching the master students the use of expert codes, such as FLUENT, for real turbulent flow simulations. Nevertheless, teaching only the mathematical models and/or numerical methodologies is definitely not enough for training good engineers. As a result, my teaching is definitely application driven, with a constant focus on relating the course material to the problems in design, analysis and optimization of turbomachines and other hydraulic systems.

The diploma theses or master dissertations (I am conducting on average 5 per year) are an opportunity for my students to put together the knowledge acquired in various disciplines to either generate a design for a turbomachine (turbine or pump) or to perform an in-depth numerical investigation of a particular flow or flow system (e.g. swirling flows, flows with separation, etc.).

Since the doctoral studies are now seen as the third cycle of higher education, with a duration of 3 years, it is essential to identify the students with potential for research activities as early as possible, in order to offer them a specific training during the 2-year master degree in order successfully continue the PhD program. This is the approach I am consistently following for selecting and training the students during the bachelor -> master -> doctoral studies. However, this is not an individual effort. All my students are included in the research group I am leading, such that they continuously benefit from the expertise of senior professors and researchers in order to accelerate the learning process.

Besides the actual courses content, and learning environment, the attractiveness of learning can be significantly increased by using suitable teaching technologies. Along this line, back in 2009 I participated in developing a project aimed at developing a "Fluids Engineering Information Platform" (PiIF, [www.piif.ro](http://www.piif.ro)) for teaching university courses related to fluid engineering (for mechanical, civil, industrial, chemical engineers, naval architects, etc.). This national project, started in 2010 for a three years duration, brings together six main technical universities in Romania, from Bucharest, Timișoara,

lași, Cluj and Galați, and has as a main goal the modernization of the national system for higher education in Fluids Engineering for bachelor and master degrees. The basic paradigm assumed by the project is that the teaching process must account for a simple relationship: “Concepts + Reasoning = Solutions”. The building block, called concepts, are presented as e-papers available on-line for both the student and the teacher within the teaching/learning process. The focus of the teacher-student interaction activities is shifted toward developing the reasoning abilities instead of memorizing a large amount of information. Moreover, the reasoning is focused toward finding solutions to real and rather complex problems, rather than solving small numerical applications of various formulae. As a result, the teacher’s role is shifted toward explaining the concepts (rather than to transfer the information) and to design learning paths such that the student could navigate through the concepts, in a suitable order, to solve one problem or another. Once again, we do not intend to offer a comprehensive collection of recipes for engineering problems. The student knows that the information is available, and his/her main task is to develop a reasoning process, using the information embedded in the concepts, to provide correct and complete engineering solutions.

I embrace for my teaching activities the statement of Charles M. Vest, President Emeritus of MIT, who said that “As we think about the plethora of challenges, it is important to remember that students are driven by passion, curiosity, engagement, and dreams”.

## Scientific Research

I formally started my scientific research activity back in 1990, when I was admitted in a PhD program at the “Politehnica” University in Timisoara, under the supervision of Prof. Ioan Anton, member of the Romanian Academy. The research program was focused on high speed water jets, with practical applications for cutting various materials. As a matter of fact, the idea of this subject originated from an ongoing research contract with a design institute for mining equipments, where a new mining technology was developed by using jet-assisted cutting of coal and rock. The research was including both theoretical issues related to the jet hydrodynamics and stability, and experimental investigations. The main theoretical developments included in the thesis are the finite element code for axi-symmetric flows with free surface, which was used for analyzing various nozzle geometries. For the experimental investigations I designed and built a complex test rig which included a very high pressure pump (up to 2000 bars) capable to deliver a jet with a velocity above 600 m/s through a sapphire nozzle with an orifice of 0.2...0.4 mm in diameter. I defended the thesis “High speed jet hydrodynamics and applications” on July 1996, and I obtained the PhD degree in mechanical engineering.

Immediately after completing my PhD thesis, I went to the Notre Dame University, Indiana, U.S.A., as Fulbright fellow at the Aerospace and Mechanical Engineering Department. The project I was involved in from the beginning was concerned with the use of high performance parallel computing of the unsteady pressure fields generated by the interaction of incoming vortical perturbations with isolated airfoils or airfoil cascades. These theoretical studies aimed at significantly reducing the airplane noise level. The main challenge in using domain decomposition techniques for parallel computing algorithms was related to the uniqueness of the subdomain solutions, which in turn was depending on the subdomain

boundary conditions. In addition, the pressure waves must be able to leave the truncated computation domain without spurious reflections which dramatically contaminate the solution. When working on these problems I benefited from the supervision of Prof. Hafiz Atassi, as well as from extremely fruitful cooperation with researchers at Argonne National Laboratory, Illinois, and Courant Institute of Mathematics, New York. Within the first year I was able to develop a novel numerical algorithm and the corresponding finite element code, with results included in a Journal of Computational Physics paper. Following these results I was granted a one year Fulbright fellowship extension, and then I was continue to further develop this robust and efficient numerical methodology during shorter stages as Postdoctoral Research Associate and Visiting Associate Professor at the same university. Overall, this research experience in unsteady aerodynamics and aeroacoustics was a boost for my career as scientific researcher, particularly with respect to mathematical modeling and numerical algorithms development for special flows.

Since 2002, the focus of my research activity, as well as of the research group I am coordinating, was related to the turbomachinery hydrodynamics and cavitation, with particular emphasis on swirling flows in hydraulic turbines. Within the cooperation with the Laboratory for Hydraulic Machines (LMH) from the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, we have developed a methodology for modeling the swirling flows downstream the hydraulic turbine runner, when the turbine is operated within a range of discharge values. The methodology was validated with experimental data obtained at LMH-EPFL, and allowed further studies on the swirling flow stability. A first important result was that the swirl stability characteristics changes from subcritical to supercritical when the turbine discharge reaches a value corresponding to an abrupt drop in overall efficiency was experimentally observed. Moreover, it was inferred the main cause of the self-induced instability of the decelerated swirling flow, when the steady axisymmetric swirl in the turbine discharge cone becomes unsteady and three-dimensional, with a well-know precessing helical vortex (so-called vortex rope). This phenomenon occurs in hydraulic turbines operated far from the best efficiency point, and it hinders the turbine normal operation through severe pressure fluctuations leading to vibrations, bearing damage, blade rupture, power swing. We have concluded that most of the technical solutions attempted in practice to mitigate the vortex rope were not actually addressing the main cause of the swirling flow instability.

As a result, we have introduced in 2006 a novel swirling flow control technique which uses a water jet injection along the symmetry axis of the conical diffuser. We teamed-up with General Electric Hydro, Canada, (now part of Andritz Hydro) to further develop this novel and promising technology (patent application "Liquid Control Jet During Part Load Operation in a Hydraulic Turbine"). The first set of joint results were presented at the 23<sup>rd</sup> IAHR Symp. on Hydraulic Machinery and Systems, Yokohama, 2006, followed by joint experimental investigations performed at the Laval University, Quebec, Canada, Dec. 2006, which successfully confirmed the preliminary numerical investigations. A comprehensive experimental investigation was further carried out from 2007 until 2010 by my PhD student Alin Bosioc, who clearly showed the capability of the jet injection approach to successfully mitigate the swirl instabilities in a conical diffuser. His Laser Doppler Velocimetry measurements for the velocity field, coupled with the unsteady pressure measurements at the wall, clarified the physical mechanism for instability mitigation by eliminating the central quasi-stagnant region and the associated vortex sheet at

the boundary with the flow confined in an annular section up to the wall. However, we have found that a complete removal of the instability requires the jet discharge to reach a rather large threshold value (about 10% of the main flow discharge). From practical applications, this is an unacceptable large value, particularly when the jet is supplied with water which bypasses the runner, thus introducing a large so-called volumetric loss. As a result, another PhD student under my supervision, Constantin Tanasa, was designing, testing, and thoroughly investigated a novel flow-feedback method for supplying the control jet with water from downstream the runner, thus eliminating the above drawback. Mr. Tanasa successfully defended his PhD thesis in 2012. The mathematical models and stability investigations of the swirling flows was also the topic of my PhD student Diana Bistriian, who defended her thesis in 2011, and this research direction is further approached by a postdoctoral researcher, Ioana Dragomirescu, starting in 2011 under my scientific coordination.

The overall program of scientific research on turbomachinery hydrodynamics is carried out in cooperation with two senior researchers from the Romanian Academy, Dr. Sebastian Muntean and Dr. Sandor Bernad, with whom I was developing a research infrastructure for high performance computing in fluid dynamics and advanced experimental flow investigations since the year 2000. Besides the basic studies on fluid dynamics, we have approached problems raised by industrial partners such as the Hidroelectrica (Romanian Hydropower company), Alstom Hydro France, Zoppas Industries, etc. It is clear that in order for the engineering research to achieve significant impact, the problems to be addressed must originate from the current practice in companies. As a result, the PhD theses subjects I am proposing are closely related to the fundamental aspects of the complex flow phenomena occurring in practice. Moreover, the my PhD students can interact with the industrial environment, with important benefits for their professional career development.

The research topics I am addressing together with the research team I am coordinating follow the long tradition of the Timișoara School of Hydraulic Machines, established in the early 1930 by Professor Aurel Bărglăzan (1905-1960) and further developed by Professor Ioan Anton (1924-2011), both members of the Romanian Academy. However, the issues we are tackling today are aimed at solving the challenges facing the modern hydraulic turbines. Initially, the hydraulic turbines were designed to operate at or in the neighborhood of the best efficiency regime. As the energy market became less and less structured, with highly fluctuating energy sources (e.g. wind, solar) the hydraulic turbines are now required to operate far from the design operating point. As a result, a plethora of new hydrodynamic phenomena emerge, with unexpected flow instabilities generating severe pressure fluctuations leading to structural damage, which ultimately hinder the turbine operation. It turns out that the empirical and ad-hoc engineering solutions cannot properly address such problems, and basic research on flow stability, followed by novel technical solutions that address the main cause of the unwanted phenomena rather than their effects should be the proper route toward new technologies to be implemented either for new turbines or to be considered when refurbishing the old ones. This is one strategic research direction I am following, together with my research associates and doctoral students in the research group I am coordinating.

## Management

### Research management

I consider that my consistent involvement in managing research activities started back in the year 2000, when I assumed the position of director for a large grant (financed by the World Bank and the Romanian Government) aimed at setting up a top research infrastructure within the framework of “multiple-users research centers” (MURC), with the aim of making operational a National Center for Engineering of Systems with Complex Fluids within the “Politehnica” University of Timisoara. It was an important effort to acquire major research equipments for magnetometry, magneto-rheology, computational fluid dynamics. The project was initiated in 1997 by Dr. L. Vekás, head of the Magnetic Liquids Laboratory, and Prof. V. Ancușa from the Hydraulic Machinery Department, but it evolved rather slowly due to the difficulties in international acquisition procedures, financial issues, etc. I took the responsibility of finalizing all project activities, with a very large budget at that time, 320,000 USD, and in association with the deputy director Dr. S. Bernad, we managed to complete the project on time by the end of the year 2001. Although important, the research infrastructure itself is useless without the human resources. Following a long tradition, initiated by Prof. I. Anton more than half a century ago, we have further developed the close cooperation between the “Politehnica” University of Timișoara and the Romanian Academy – Timișoara Branch. As a result, the new research center benefited from a team of senior researchers for its two main research directions: magnetic liquids (preparation, magnetometry, rheology, magnetorheology) and hydrodynamics (computational fluid dynamics, experimental investigations of turbomachines). The research team was traditionally interdisciplinary, including engineers (mechanical, electrical, chemical), physicists and chemists. Moreover, young researchers were continuously joining the research center, either as post-doctoral researchers or doctoral students. Nowadays, the Research Center for Engineering of Systems with Complex Fluids (Centrul de Cercetări pentru Ingineria Sistemelor cu Fluide Complexe - CCISFC) <http://mh.mec.upt.ro/ccisfc>, within the “Politehnica” University of Timișoara - UPT is a performant and sustainable research unit.

It became clear from my experience in managing a research center, that it is essential to continuously attract young students (selected from the final year of the bachelor cycle, continuing with the master degree and then with a doctoral program), and to immerse them in a well structured research team, with experienced senior researchers. The tandem PhD student – PhD advisor has only limited capabilities to successfully approach complex engineering problems, without the daily interaction with other researchers and PhD students.

Besides the research management activity within the CCISFC-UPT, I was actively involved in research management at the national level, as chairman of the Engineering Science Committee within the National University Research Council (NURC) for the period 2007-2011. In this position I was coordinating the national competitions for research grants within two main programs of the national research plan: Human Resources and IDEAS (basic research). Besides these activities, I organized the grants monitoring activities, in order to increase the quality of the Romanian research with respect to international standards, as well as to increase the visibility and recognition of Romanian researchers within the international research community.

Currently, I contribute, as advisor to the President of the National Authority for Scientific Research, to shape the national strategy for research-development-innovation (RDI) for the period 2014-2020, within the paradigm of Smart Specialization promoted by the European Union. It became obvious from the ongoing national research plan that focusing the limited resources available on a rather small number of well defined priorities is the key to increase the impact of research, development and innovation activities within the economy and society. However, defining such priorities is an extremely difficult task, since we have to accommodate an existing infrastructure and expertise with the actual needs emerging both at the national and regional levels.

With respect to the development of human resource for RDI activities, the doctoral and post-doctoral programs should accommodate the demand for creativity, with new emerging ideas, with the clear requirements to address the challenges facing the modern society. This is a key ingredient for increasing both the visibility and recognition of researchers as one of the main engine for societal and economical development. I consider that this should be a major coordinate for developing and focusing the doctoral studies in a university.

### **Scientific events organization**

A confirmation of the visibility and worldwide recognition of our research group in hydraulic machines came at the 25<sup>th</sup> IAHR Symposium on Hydraulic Machinery and Systems, <http://acad-tim.tm.edu.ro/iahr2010/>, Timișoara, Sep. 20-24, 2010, where I was the chairman of the organizing committee. This prestigious symposium is held every two years since 1960, and the 25<sup>th</sup> edition marked its half a century anniversary. The International Association of Hydro-Environment Engineering and Research (IAHR) celebrated its 75th anniversary in 2010. IAHR particularly promotes the advancement and exchange of knowledge through working groups, specialty symposia, congresses, and publications on water resources, river and coastal hydraulics, risk analysis, energy, environment, disaster prevention, industrial processes. The 25<sup>th</sup> IAHR Symposium on Hydraulic Machinery and Systems brought together 227 scientists and researchers from 24 countries, affiliated with universities, technology centres and industry to debate topics related to advanced technologies for hydraulic machinery and systems, which will enhance the sustainable development of water resources and hydropower production. The Scientific Committee has selected 118 papers, out of 238 abstracts submitted, on the following topics: (i) Hydraulic Turbines and Pumps, (ii) Sustainable hydropower, (iii) Hydraulic Systems, (iv) Advances in Computational and Experimental Techniques, (v) Innovative Technology, presented at the symposium and included in the proceedings published with the IOP Conference Series: Earth and Environmental Science, <http://iopscience.iop.org/1755-1315/12/1>. More details on the symposium can be found in the post-conference report at <http://acad-tim.tm.edu.ro/iahr2010/pdf/IAHR2010PostConfReport.pdf>.

Three years before the above symposium, I chaired the organizing committee of the 2<sup>nd</sup> IAHR International Meeting of the WorkGroup on Cavitation and Dynamic Problems in Hydraulic Machinery and Systems, Timișoara, Oct. 24-26, 2007, <http://mh.mec.upt.ro/iahrwg2007>. More than 80 participants joined this meeting, with the main focus on unsteadiness of the flow in hydraulic machines and associated hydraulic systems, as well as cavitation inception and development, looking for solutions to mitigate the unwanted and potentially dangerous effects of these special flow phenomena.

Another major event where I was directly involved in organization, particularly in papers review and proceeding editing, was the 6<sup>th</sup> International Conference on Hydraulic Machines and Hydrodynamics, <http://mh.mec.upt.ro/hmh2004/>, Timișoara, Oct. 21-22, 2004. This series of conferences was hosted every 4 years by the Hydraulic Machines Department of the “Politehnica” University from Timișoara.

Besides such major events, I initiated back in 2004, the bi-lateral cooperation with the University of Stuttgart, Institute of Fluid Mechanics and Hydraulic Machinery, <http://www.ihs.uni-stuttgart.de>. Within this academic cooperation initiative, we organize joint meetings called “German-Romanian Workshop on Turbomachinery Hydrodynamics” (GRoWTH), alternatively in Timișoara and Stuttgart, since 2005. This year, we had the GRoWTH8 meeting in Stuttgart. The main focus of these meetings is to allow young researchers from both HIS-Stuttgart and CCISFC-Timișoara to present and discuss their on-going research projects within doctoral and post-doctoral programs, as well as to allow the senior researchers to debate the main research directions and issues of mutual interest. Such semi-formal meetings are an excellent opportunity for the young researchers to interact with their colleagues and exchange ideas as well as expertise in both computational and experimental fluid mechanics and turbomachinery hydrodynamics.

Within the consortium project “Vortex Hydrodynamics and Application”, which brought together 9 research teams from Romanian universities in Timisoara, Bucharest, Galati, Iasi, Cluj and Resita, I was organizing every year the project workshops between 2005-2007. These meetings were excellent opportunities to coagulate the Romanian research community on fluids engineering starting with a topic of mutual interest - vortex hydrodynamics – and exploring various applications in turbomachines, wind engineering, naval hydrodynamics, hydraulic power systems, etc.

In conclusion, I consider that the active involvement of senior researchers in organizing a range of scientific events is definitely paying off in terms of motivating the research teams to reach international standards. Moreover, the direct feedback from other experts on either the relevance and potential impact of the research problems, as well as on the quality of the results, as well as the interaction with researchers who share similar topics and/or approaches, bring a strong motivation for young researchers as well as for the research group leaders to continuously enhance their research activities.



## Publications

## Books

	Title	Authors	Publisher, year, pages, ISBN	Pages pers. Contrib
1.	VORTEX DOMINATED FLOWS	SUSAN-RESIGA R., BERNAD S., MUNTEAN S., (eds)	Editura Eurostampa, Timișoara, 2007, 492 p. ISBN 978-973-687-659-2	90
2.	MECANICA FLUIDELOR NUMERICĂ	SUSAN-RESIGA R.	Editura Orizonturi Universitare, Timișoara, 2003, 223 p. ISBN 973-638-014-9	223
3.	METODE MODERNE de CALCUL PARALEL pentru SIMULAREA CURGERII FLUIDELOR	SUSAN-RESIGA R., MUNTEAN S., BERNAD S., BALINT D., BALINT I.	Editura Orizonturi Universitare, Timișoara, 2003, 290 p. ISBN 973-638-064-5	92
4.	COMPLEMENTE de MECANICA FLUIDELOR și TEHNICI de SOLUȚIONARE NUMERICĂ	SUSAN-RESIGA R., MUNTEAN S., BERNAD S., BALINT D., BALINT I.	Editura Orizonturi Universitare, Timișoara, 1999, 290 p. ISBN 973-638-064-5	246
5.	INTRODUCERE în TEORIA GRAFURILOR. METODA DRUMULUI CRITIC	IZVERCIAN P.N., CREȚU V., IZVERCIAN M., SUSAN-RESIGA R.	Editura de Vest, Timișoara, 1994, 234 p. ISBN 973-36-0176-4	58

## Course material

	Title	Authors	Publisher, year, pages, ISBN	Pages pers. Contrib
1.	MECANICA FLUIDELOR, MAȘINI HIDRAULICE și ACȚIONĂRI. APLICAȚII de CALCUL	ANTON L.E., BALINT D., BAYA A., BĂDĂRĂU R., BĂLĂȘOIU V., BEJ A., MILOȘ T., MUNTEAN S., <u>SUSAN-RESIGA R.</u> , STUPARU A.	Editura Orizonturi Universitare, Timișoara, 2004, 262 p., ISBN 973-638-0769	14
2.	MECANICA FLUIDELOR EXPERIMENTALĂ. PARTEA I: ELEMENTE FUNDAMENTALE	ANTON L.E., BAYA A., MILOȘ T., <u>SUSAN-RESIGA R.</u>	Editura Orizonturi Universitare, Timișoara, 2002, 135 p., ISBN 973-8391-72-5	40
3.	METODE NUMERICE. LUCRĂRI PRACTICE	<u>SUSAN-RESIGA ROMEO</u>	Litografia Universității Tehnice din Timișoara, 1994, 80 p.	80

**Journal papers**

	Title	Authors	Journal / publication
1.	UNSTEADY PRESSURE ANALYSIS OF A SWIRLING FLOW WITH VORTEX ROPE AND AXIAL WATER INJECTION IN A DISCHARGE CONE	BOSIOC A.I., <u>SUSAN-RESIGA R.</u> , MUNTEAN S., TANASA C.	ASME Journal of Fluids Engineering, 2012 (in press)
2.	COMPUTATION OF STRESS DISTRIBUTION IN A FRANCIS TURBINE RUNNER INDUCED BY FLUID FLOW	NEGRU R, MUNTEAN S., MARSAVINA L, <u>SUSAN-RESIGA R.</u> , PASCA N.	Computational Materials Science, 2012 (in press)
3.	MATHEMATICAL MODELLING OF SWIRLING FLOW IN HYDRAULIC TURBINES FOR THE FULL OPERATING RANGE	<u>SUSAN-RESIGA R.F.</u> , MUNTEAN S., AVELLAN F., ANTON I.	Applied Mathematical Modelling, Vol. 35 (2011), pp. 4759-4773.
4.	FLOW-FEEDBACK CONTROL TECHNIQUE FOR VORTEX ROPE MITIGATION FROM CONICAL DIFFUSER OF HYDRAULIC TURBINES	TANASA C., BOSIOC A.I., MUNTEAN S., <u>SUSAN-RESIGA R.</u>	Proc. Romanian Academy, Series A, Vol. 12, No. 2, pp. 125-132, 2011.
5.	PRESSURE RECOVERY IMPROVEMENT IN A CONICAL DIFFUSER WITH SWIRLING FLOW USING WATER INJECTION	BOSIOC A.I., TANASA C., MUNTEAN S., <u>SUSAN-RESIGA R.</u>	Proc. Romanian Academy, Series A, Vol. 11, No. 3, pp. 245-252, 2010.
6.	ANALYSIS AND PREVENTION OF VORTEX BREAKDOWN IN THE SIMPLIFIED DISCHARGE CONE OF A FRANCIS TURBINE	<u>SUSAN-RESIGA R.</u> , MUNTEAN S., HASMATUCHI V., ANTON I., AVELLAN F	J. Fluids Engineering, Vol 132, Issue 5, May 2010, paper 051102 (15 pages)
7.	AXISYMMETRIC SWIRLING FLOW SIMULATION OF THE DRAFT TUBE VORTEX IN FRANCIS TURBINES AT PARTIAL DISCHARGE	<u>SUSAN-RESIGA R.</u> , MUNTEAN S., STEIN P., AVELLAN F.	Int. J. Fluid Machinery and Systems, Vol. 2, No. 4, 2009, pp. 295-302
8.	NUMERICAL INVESTIGATION OF THE UNSTEADY FLOW IN THE ACHARD TURBINE	BERNAD S. I., GEORGESCU A., GEORGESCU S.-CARMEN, <u>SUSAN-RESIGA R.</u>	New Aspects of Fluid Mechanics and Aerodynamics" WSEAS Mechanical Engineering Series WSEAS Press 2008, ISSN 1790-5095, ISSN:1790-5095, ISBN 978-960-6766-98-5, pp. 59-65.
9.	CARDIO VASCULAR SURGERY - SIMULATION BASED MEDICAL INTERVENTION	BERNAD SI, BARBAT T, BERNAD ES, <u>SUSAN-RESIGA R</u>	MATHEMATICS AND COMPUTERS IN BIOLOGY AND CHEMISTRY, pp: 100-106, 2008, ISSN: 1790-5125, ISBN: 978-960-6766-75-6, WSEAS Press, 2008
10.	FLOW INVESTIGATIONS IN ACHARD TURBINE	BERNAD S, GEORGESCU A, GEORGESCU SC, <u>SUSAN-RESIGA R</u> , ANTON I	PROCEEDINGS OF THE ROMANIAN ACADEMY SERIES A- MATHEMATICS PHYSICS TECHNICAL SCIENCES INFORMATION SCIENCE 9 (2):129-140, 2008.
11.	CAVITATION PHENOMENA IN HYDRAULIC VALVES. NUMERICAL MODELLING	SANDOR BERNAD, <u>ROMEO SUSAN-RESIGA</u> , SEBASTIAN MUNTEAN, IOAN ANTON,	Proceedings of the Romanian Academy, Series A, Vol. 8, No. 2/2007, pp: 117-126.
12.	ANALYSIS OF THE SWIRLING FLOW	<u>SUSAN-RESIGA R.</u> , CIOCAN	JOURNAL OF FLUIDS

	DOWNSTREAM A FRANCIS TURBINE RUNNER	G.D., ANTON I., AVELLAN F.	ENGINEERING, Vol. 128, pp. 177-189, 2006
13.	THIN HYDROFOIL CASCADE DESIGN AND NUMERICAL FLOW ANALYSIS. PART I – DESIGN	SUSAN-RESIGA R., MUNTEAN S., BERNAD S., FRUNZA T., BALINT D.	Proceedings of the Romanian Academy, Series A., Vol. 7, No. 2/2006, pp. 117-126
14.	NUMERICAL ANALYSIS OF CAVITATING FLOWS	BERNAD S., SUSAN-RESIGA R., MUNTEAN S., ANTON I.	Proceedings of the Romanian Academy, Series A., Vol. 7, No. 1/2006, pp. 21-33
15.	MIXING INTERFACE ALGORITHM FOR 3D TURBULENT FLOW ANALYSIS OF THE GAMM FRANCIS TURBINE	MUNTEAN S., SUSAN-RESIGA R., ANTON I.	In Vad J., Lajos T., Schilling R., (eds), Modelling Fluid Flow – State of the Art, Springer Verlag, 2004, pp. 359-372
16.	A NEW DOMAIN DECOMPOSITION APPROACH FOR THE GUST RESPONSE PROBLEM	SCOTT J.R., ATASSI H.M., SUSAN-RESIGA R.	AIAA Collection of Technical Papers, paper 2003-883, NASA /TM-2002-212010
17.	DETERMINATION OF THE MECHANICAL REQUIREMENTS FOR A PROGRESSIVE CORRECTION SYSTEM OF PECTUM EXCAVATUM IN CHILDREN	BOIA E.S., SUSAN-RESIGA R., RAICOV P.C., POPOIU C.M., IACOB R.E.	Journal of Laparoscopic & Advanced Surgical Techniques, Vol. 15, No. 5, pp. 478-481, 2005.
18.	DOMAIN-DECOMPOSITION METHOD FOR TIME-HARMONIC AEROACOUSTIC PROBLEMS	SUSAN-RESIGA R., ATASSI H.M.	AIAA Journal, Vol. 39, No. 5, pp. 802-809, 2001.
19.	A DOMAIN DECOMPOSITION METHOD FOR THE EXTERIOR HELMHOLTZ PROBLEM	SUSAN-RESIGA R., ATASSI H.M.	Journal of Computational Physics, Vol. 147, pp. 388-401, 1998.
20.	LATTICE BOLTZMANN APPROACH TO VISCOUS FLOWS BETWEEN PARALLEL PLATES	SZILAGYI B., SUSAN-RESIGA R., SOFONEA V.	International Journal of Modern Physics C, Vol. 6, No 3, pp. 345-358, 1995.
21.	ADDITIVE SCHWARZ METHODS WITH NONREFLECTING BOUNDARY CONDITIONS FOR PARALLEL COMPUTATION OF HELMHOLTZ PROBLEMS	MCINNES L.C., SUSAN-RESIGA R., KEYES D.E., ATASSI H.M.	Contemporary Mathematics, Vol. 218, American Mathematical Society, pp. 325-333, 1998.
22.	PARALLEL SOLUTION OF HELMHOLTZ PROBLEMS USING ADDITIVE SCHWARZ METHODS	MCINNES L.C., SUSAN-RESIGA R., ATASSI H.M., KEYES D.E.	Mathematical and Numerical Aspects of Wave Propagation, J. A. DeSanto (editor), SIAM, 1998, pp. 623-625, 1998
23.	PARALLEL COMPUTING USING SCHWARZ DOMAIN DECOMPOSITION METHOD FOR AEROACOUSTIC PROBLEMS	SUSAN-RESIGA R., ATASSI H.M.	AIAA Paper 98-2218, AIAA <sup>(3)</sup> /CEAS <sup>(4)</sup> Collection of Technical Papers
24.	A DOMAIN DECOMPOSITION METHOD FOR TIME-HARMONIC AEROACOUSTIC PROBLEMS	ATASSI H.M., SUSAN-RESIGA R.	AIAA Collection of Technical Papers, Paper 99-0355
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	Title	Authors	International publication no.
1.	LIQUID CONTROL JET DURING PART LOAD OPERATION IN A HYDRAULIC TURBINE	CIOCAN G.D., VU T.C., NENNEMANN B., DEMERS E, <u>SUSAN-RESIGA R.</u>	WO 2007/142709

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3.	SWIRLING FLOW APPARATUS AND TEST RIG FOR FLOW CONTROL IN HYDRAULIC TURBINES DISCHARGE CONE	<u>ROMEO SUSAN-RESIGA</u> , SEBASTIAN MUNTEAN, ALIN BOSIOC, ADRIAN STUPARU, TEODOR MILOȘ, ALEXANDRU BAYA, SANDOR BERNAD, LIVIU EUGEN ANTON	Scientific Bulletin "Politehnica" University of Timisoara, Transactions on Mechanics, 52(66), No 6, pp. 203-216, 2007, ISSN 1224-6077.
4.	2D UNSTEADY FLOW SIMULATION IN THE ACHARD TURBINE	SANDOR BERNAD, ANDREI MUGUR-GEORGESCU, SANDA-CARMEN GEORGESCU, DANIEL BALINT, <u>ROMEO SUSAN-RESIGA</u>	Scientific Bulletin of the "Politehnica" University of Timisoara, Transactions on Mechanics, Tom 52(66), No 3, pp: 23 - 28, 6 pg., 2007, ISSN 1224-6077.
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2.	NUMERICAL INVESTIGATION OF THE JET CONTROL METHOD FOR SWIRLING FLOW WITH PRECESSING VORTEX ROPE	MUNTEAN S., <u>SUSAN-RESIGA R.F.</u> , BOSIOC A.	Proc. 3 <sup>rd</sup> IAHR Int. Meeting of the Workgroup on Cavitation and Dynamic Problems in Hydraulic Machinery and Systems, Brno, 2009, pp. 65-74
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28.	3D FLOW ANALYSIS IN THE SPIRAL CASE AND DISTRIBUTOR OF A KAPLAN TURBINE	MUNTEAN S., BALINT D., <u>SUSAN-RESIGA R.</u> , ANTON I., DÂRZAN C.	Proceedings of the 22 <sup>nd</sup> IAHR Symposium, Stockholm 2004, A10-2, pp. 1-10
29.	3D TURBULENT FLOW ANALYSIS OF THE GAMM FRANCIS TURBINE FOR VARIABLE DISCHARGE	MUNTEAN S., <u>SUSAN-RESIGA R.</u> , BERNAD S., ANTON I.	Proceedings of the 22 <sup>nd</sup> IAHR Symposium, Stockholm 2004, A11-2, pp. 1-10
30.	NUMERICAL INVESTIGATION OF 3D CAVITATING FLOW IN FRANCIS TURBINES	<u>SUSAN-RESIGA R.</u> , MUNTEAN S., BERNAD S., ANTON I.	Proceedings of the Conference on Modelling Fluid Flow CMFF03, Budapest 2003, ISBN 9634207790 Vol II, pp. 950-957
31.	MIXING INTERFACE ALGORITHM FOR 3D TURBULENT FLOW ANALYSIS OF THE GAMM FRANCIS TURBINE	MUNTEAN S., <u>SUSAN-RESIGA R.</u> , ANTON I.	Proceedings of the Conference on Modelling Fluid Flow CMFF03, Budapest 2003, ISBN 9634207790 Vol II, pp. 1198-1205
32.	A NUMERICAL APPROACH FOR THE 3D FLOWS IN KAPLAN TURBINES	BALINT D., <u>SUSAN-RESIGA R.</u> , MUNTEAN S.	Proceedings of the International Conference on Case Studies on Hydraulic Systems CSHS03, ISBN 8670834693 Belgrad 2003, pp.29-36

33.	NUMERICAL ANALYSIS OF CAVITATION INCEPTION IN FRANCIS TURBINE	<u>SUSAN-RESIGA R.</u> , MUNTEAN S., ANTON I.	Proceedings of the XXI <sup>st</sup> IAHR Symposium of Hydraulic Machinery and Systems, Lausanne, 2002, pp. 431-438
34.	3D FLOW ANALYSIS OF THE GAMM FRANCIS TURBINE FOR VARIABLE DISCHARGE	MUNTEAN S., <u>SUSAN-RESIGA R.</u> , ANTON I.	Proceedings of the XXI <sup>st</sup> IAHR Symposium of Hydraulic Machinery and Systems, Lausanne, 2002, pp. 213-220
35.	FINITE ELEMENT ANALYSIS OF CASCADE FLOWS	FRUNZĂ TEODORA, <u>SUSAN-RESIGA R.</u>	Proceedings of the "Classics and Fashion in Fluid Machinery" Conference, Beograd, 2002, pp. 169-178.
36.	NUMERICAL SIMULATION OF 3D FLOW IN KAPLAN HYDRAULIC TURBINE	BALINT D., <u>SUSAN-RESIGA R.</u> , MUNTEAN S.	Proceedings of the "Classics and Fashion in Fluid Machinery" Conference, Beograd, 2002, pp. 179-186.
37.	FLUENT NUMERICAL SIMULATION OF THE MOLD FILLING PROCESS FOR TITANIUM DENTAL CASTING APPLICATIONS	BERNAD S. I., <u>SUSAN-RESIGA R.</u> , MUNTEAN S.	Proceedings of the 2002 Southeastern Europe FLUENT Users Group Meeting, Thessaloniki, Greece, 2002 (on CD-ROM).
38.	LEAST SQUARES PIECEWISE POLYNOMIAL MIXING INTERFACE ALGORITHM AND APPLICATIONS FOR FRANCIS HYDRAULIC TURBINES	MUNTEAN S., <u>SUSAN-RESIGA R.</u> , ANTON I.	Proceedings of the 2002 Southeastern Europe FLUENT Users Group Meeting, Thessaloniki, Greece, 2002 (on CD-ROM).
39.	MIXING INTERFACE METHOD APPLIED TO THREE-DIMENSIONAL FLOW THROUGH FRANCIS TURBINE	MUNTEAN S., <u>SUSAN-RESIGA R.</u> , ANTON I., ANCUȘA V.	Proceedings of the 2 <sup>nd</sup> Southeastern Europe FLUENT Users Group Meeting, Bucharest, 2001 (on CD-ROM).
40.	NUMERICAL SIMULATION OF CAVITATING FLOW IN HYDRAULIC POPPET VALVE – PART II	BERNAD S., <u>SUSAN-RESIGA R.</u> , ANTON I., ANCUȘA V.	Proceedings of the 2 <sup>nd</sup> Southeastern Europe FLUENT Users Group Meeting, Bucharest, 2001 (on CD-ROM).
41.	VORTEX FLOW MODELING INSIDE THE POPPET VALVE CHAMBER – PART 2	BERNAD S., <u>SUSAN-RESIGA R.</u> , ANTON I., ANCUȘA V.	Bath Workshop on Power Transmission & Motion Control, PTMC 2001, Bath, U.K. 2001, pag. 161-176.
42.	VORTEX FLOW MODELING INSIDE THE POPPET VALVE CHAMBER	<u>SUSAN-RESIGA R.</u> , BERNAD S. I., ANTON I.	Proceedings of the 7 <sup>th</sup> Scandi-navian International Conference on Fluid Power, SICFP'01, 2001, Linköping, Sweden.
43.	PARALLEL COMPUTATION OF HARMONIC WAVES USING DOMAIN DECOMPOSITION. PART 1: GENERAL FORMULATION	ATASSI H. M., <u>SUSAN-RESIGA R.</u>	Proceedings of the ASME Noise Control and Acoustics Division, NCA-Vol. 25, 1998, pp. 375-379
44.	PARALLEL COMPUTATION OF HARMONIC WAVES USING DOMAIN DECOMPOSITION. PART 2: NUMERICAL IMPLEMENTATION AND APPLICATIONS	<u>SUSAN-RESIGA R.</u> , ATASSI H. M.	Proceedings of the ASME Noise Control and Acoustics Division, NCA-Vol. 25, 1998, pp. 381-388

45.	FINITE ELEMENT ANALYSIS OF CYLINDRICAL CUTTING NOZZLE HYDRODYNAMICS, "MICROCAD'95"	<u>SUSAN-RESIGA R.</u>	International Computer Science Conference, Miskolc-Egyetem-varos, Hungary, 1995, Section K: Modern Numerical Methods, pp. 68-71
46.	ATTENUATOR'S VOLUME INFLUENCE ON HIGH PRESSURE PULSATIONS IN A JET CUTTING UNIT	<u>SUSAN-RESIGA R.</u>	Proceedings of the 11-th International Conference on Jet Cutting Technology, St. Andrews, Scotland, 1992, pp. 37-45.

### National Conference papers, in English

	Title	Authors	Conference / publication
1.	BLOOD FLOW IN HEART BY-PASS. NUMERICAL INVESTIGATIONS	<u>ROMEO SUSAN-RESIGA</u> , SANDOR I. BERNAD, TIBERIU BĂRBAT, ELENA S. BERNAD	Conferința Progrese în Simularea Echipamentelor și Proceselor Industriale. Soluții Eficiente cu ANSYS & FLUENT", 29-30 Mai, Sinaia, CD-ROM, 10 pages, ISBN: 975-686-521-612-7.
2.	CAVITATING FLOW MODELING AND NUMERICAL ANALYSIS	BERNAD S., <u>SUSAN-RESIGA R.</u> , MUNTEAN S., ANTON I.	Workshop on Turbomachinery Hydrodynamics, Timișoara, 2005, pp. 76-85.
3.	THREE-DIMENSIONAL CAVITATING FLOW IN HYDRAULIC FRANCIS TURBINES	MUNTEAN S., BERNAD S., <u>SUSAN-RESIGA R.</u> , ANTON I.	Workshop on Turbomachinery Hydrodynamics, Timișoara, 2005, pp. 86-90.
4.	HYDROFOIL CASCADE DESIGN AND FINITE ELEMENT FLOW ANALYSIS	<u>SUSAN-RESIGA R.</u> , MUNTEAN S., BERNAD S., FRUNZĂ T., BALINT D.	Workshop on Turbomachinery Hydrodynamics, Timișoara, 2005, pp. 91-104.
5.	TURBOMACHINERY SWIRLING FLOWS	<u>SUSAN-RESIGA R.</u> , MUNTEAN S., BERNAD S., ANTON I.	Workshop on Turbomachinery Hydrodynamics, Timișoara, 2005, pp. 105-115.
6.	DEVELOPMENT OF TURBOMACHINERY COMPUTATIONAL TOOLBOX. CASCADEXPERT: CASCADE HYDRODYNAMICS FROM THEORY AND NUMERICAL ALGORITHMS TO EXPERT SOFTWARE	<u>SUSAN-RESIGA R.</u> , FRUNZĂ T., MUNTEAN S., BERNAD S.	International Conference Energy-Environment CIEM 2005, București, ISBN 973869485X pp. 3-69...3-74
7.	REDUCING FLOW NON-UNIFORMITIES BY RESHAPING THE STAY VANES GEOMETRY OF A KAPLAN TURBINE	BALINT D., MUNTEAN S., <u>SUSAN-RESIGA R.</u>	International Conference Energy-Environment CIEM 2005, București, ISBN 973869485X pp. 3-7...3-12
8.	ACCURATE EVALUATION OF KAPLAN TURBINES EFFICIENCY BY IMPROVING THE SUBDOMAIN NUMERICAL COUPLING APPROACH	BALINT D., <u>SUSAN-RESIGA R.</u> , MUNTEAN S.	International Conference Energy-Environment CIEM 2005, București, ISBN 973869485X pp. 3-1...3-6
9.	SUPERCONVERGENT PATCH RECOVERY FOR VELOCITY COMPUTATION ON UNSTRUCTURED MESH AND CASCADE FLOW	FRUNZĂ T., <u>SUSAN-RESIGA R.</u>	Proceedings of the Workshop on Numerical Methods in Fluid Mechanics and FLUENT Applications,

	APPLICATION		ISBN 973638022X Timișoara 2003, pp.64-75
10.	2D VERSUS 3D NUMERICAL SIMULATIONS OF IDEAL FLOW IN KAPLAN HYDRAULIC TURBINES	BALINT D., <u>SUSAN-RESIGA R.</u> , MUNTEAN S.	Proceedings of the Workshop on Numerical Methods in Fluid Mechanics and FLUENT Applications, ISBN 973638022X Timișoara 2003, pp.56-63
11.	3D CAVITATING FLOW IN HYDRAULIC FRANCIS TURBINES	MUNTEAN S., BERNAD S., <u>SUSAN-RESIGA R.</u>	Proceedings of the Workshop on Numerical Methods in Fluid Mechanics and FLUENT Applications, ISBN 973638022X Timișoara 2003, pp.37-45
12.	MIXING INTERFACE METHOD FOR 3D TURBULENT FLOW ANALYSIS APPLIED TO FRANCIS TURBINE	MUNTEAN S., <u>SUSAN-RESIGA R.</u> , BERNAD S., ANTON I.	Proceedings of the Workshop on Numerical Methods in Fluid Mechanics and FLUENT Applications, ISBN 973638022X Timișoara 2003, pp.22-36
13.	ANALYSIS AND DEVELOPMENT OF CAVITATION FLOW MODEL AND FLUENT IMPLEMENTATION	<u>SUSAN-RESIGA R.</u> , BERNAD S., MUNTEAN S., ANTON I.	Proceedings of the Workshop on Numerical Methods in Fluid Mechanics and FLUENT Applications, ISBN 973638022X Timișoara 2003, pp.11-21
14.	SOFTWARE DEVELOPMENT FOR CASCADE FLOW SIMULATION	FRUNZĂ TEODORA, <u>SUSAN-RESIGA R.</u>	Anton I., Ancușă V., Susan-Resiga R. (Eds.), Proceedings of the Workshop on Numerical Simulation for Fluid Mechanics and Magnetic Liquids, Ed. Orizonturi Universitare, Timișoara 2001, pp. 57-68
15.	NUMERICAL SIMULATION OF CAVITATING FLOW IN HYDRAULIC POPPET VALVE	BERNAD S., <u>SUSAN-RESIGA R.</u> , ANCUȘA V., ANTON I.	Anton I., Ancușă V., Susan-Resiga R. (Eds.), Proceedings of the Workshop on Numerical Simulation for Fluid Mechanics and Magnetic Liquids, Ed. Orizonturi Universitare, Timișoara 2001, pp. 140-153.
16.	MIXING INTERFACE METHOD APPLIED TO THREEDIMENSIONAL FLOW THROUGH FRANCIS TURBINE	MUNTEAN S., <u>SUSAN-RESIGA R.</u> , ANTON I., ANCUȘA V.	Anton I., Ancușă V., Susan-Resiga R. (Eds.), Proceedings of the Workshop on Numerical Simulation for Fluid Mechanics and Magnetic Liquids, Ed. Orizonturi Universitare, Timișoara 2001, pp. 25-44.
17.	DESIGN OPTIMIZATION OF THE SYNCHRONIZATION SYSTEM FOR HIGH PRESSURE INTENSIFIER, USING THE FINITE ELEMENT METHOD	<u>SUSAN-RESIGA R.</u> , RAICOV P.C.	Proceedings of the 2 <sup>nd</sup> Conference on Boundary and Finite Elements, Sibiu, Section 2.1, pp. 100-105, 1993.
18.	STUDY OF THE FLOW IN A CYCLONE EXTENSION FURNACE BY USING THE FINITE ELEMENT METHOD	<u>SUSAN-RESIGA R.</u> , OPRIȘA P.D.	Proceedings of the 2 <sup>nd</sup> Conference on Boundary and Finite Elements, Sibiu, Section 3, pp. 150-155, 1993.
19.	FINITE ELEMENT ANALYSIS OF FREE-SURFACE AXISYMMETRIC FLOWS, USING THE STREAM FUNCTION FORMULATION	<u>SUSAN-RESIGA R.</u>	Proceedings of the 4 <sup>th</sup> Conference on Hydraulic Machinery and Hydrodynamics, Timișoara, Vol. I, pp. 91-98, 1994.

20.	FINITE ELEMENT ANALYSIS OF FREE-SURFACE AXISYMMETRIC FLOWS, USING THE VELOCITY POTENTIAL FORMULATION	<u>SUSAN-RESIGA R.</u>	Proceedings of the 4 <sup>th</sup> Conference on Hydraulic Machinery and Hydrodynamics, Timișoara, Vol. I, pp. 83-90, 1994.
21.	DETERMINATION OF AXISYMMETRIC JET SURFACE BY USING F.E.M.	<u>SUSAN-RESIGA R.</u>	Proceedings of the Workshop on Computational Fluid Dynamics, Galați, pp. 77-85, 1993.

### National Conference papers, in Romanian

	Title	Authors	Conference / publication
1.	ANALIZA NUMERICĂ A CURGERII ÎN DISTRIBUTORUL TURBINELOR HIDRAULICE	<u>SUSAN-RESIGA R.</u> , MUNTEAN S.	Lucrările Primei Conferințe a Hidroenergeticienilor din România, București, 2000, pag. 469-478.
2.	STUDIUL NUMERIC AL CURGERII ÎN FANTELE DISTRIBUTOARELOR CU SERTAR CILINDRIC	<u>SUSAN-RESIGA R.</u> , MUNTEAN S.	Conferința Internațională de Sisteme Hidropneumatice de Acționare, Timișoara, 1995, Vol. II, pg. 208-218.
3.	INFLUENȚA CARACTERISTICII ROBINETULUI ȘI A TIMPULUI DE ÎNCHIDERE ASUPRA SUPRAPRESIUNII DIN CONDUCTA DE GOLIRE A UNUI REZERVOR	<u>SUSAN-RESIGA R.</u>	A II-a Sesiune de Comunicări Științifice a Universității "Aurel Vlaicu" Arad, 1994, Vol. "Tehnologii de Prelucrare", pg. 63-70.
4.	ANALIZA CU ELEMENTE FINITE A CURGERII ROTAȚIONALE ÎN SEMIPLANUL MERIDIAN AL UNUI ANTEFOCAR CICLON	<u>SUSAN-RESIGA R.</u> , OPRIȘA P.D	Conferința Națională de Termotehnică, Timișoara, 1994, Vol. IV, pg. 161-166
5.	STUDIUL NUMERIC AL CURGERII PRIN CAMERELE DE LUCRU ALE DISTRIBUTORULUI CU SERTAR CILINDRIC LINIAR	<u>SUSAN-RESIGA R.</u> , RASZGA C.	Sesiunea de comunicări științifice, Universitatea "Transilvania" Brașov, 1993, Vol. VI, pg. 61-68.
6.	MODELAREA PRIN METODA ELEMENTULUI FINIT A CAMPULUI TERMIC ÎNTR-UN ANTEFOCAR	OPRIȘA P.D., <u>SUSAN-RESIGA R.</u>	A III-a Conferință Națională de Termotehnică, București, 1993, Vol. II, pg. 331-334
7.	INFLUENȚA SPAȚIULUI MORT ȘI A INTERȘTIULUI ETANȘĂRII ASUPRA FUNCȚIONĂRII UNEI INSTALAȚII DE TĂIERE CU JET DE LICHID	<u>SUSAN-RESIGA R.</u>	Sesiunea de comunicări științifice "Concepție, Tehnologie și Management în Construcția de Mașini", Iași, 1992, pg. 155-160.
8.	INFLUENȚA UNDELOR DE PRESIUNE DIN CONDUCTA DE ASPIRAȚIE ASUPRA UMPLERII UNUI CILINDRU ÎN REGIM	<u>SUSAN-RESIGA R.</u>	Conferința de Mașini Hidraulice și Hidrodinamică, Timișoara, 1990, Vol.

	NESTAȚIONAR		I, pp. 213-218
9.	COMPARAȚIE ÎNTRE REZULTATELE TEORETICE ȘI EXPERIMENTALE LA CURGEREA NESTAȚIONARĂ A UNUI FLUID COMPRESIBIL PRINTR-O CONDUCTĂ	<u>SUSAN-RESIGA R.</u>	Conferința de Mașini Hidraulice și Hidrodinamică, Timișoara, 1990, Vol. I, pp. 207-212.
10.	UTILIZAREA PRINCIPIULUI MINIMEI DISIPAȚII LA DETERMINAREA PROFILULUI DE VITEZE PENTRU UN FLUID NEWTONIAN	<u>SUSAN-RESIGA R.</u>	Conferința de Mașini Hidraulice și Hidrodinamică, Timișoara, 1990, Vol. I, pp. 201-206.
11.	STUDIUL RELAȚIILOR CRITERIALE PENTRU CALCULUL SCHIMBULUI DE CĂLDURĂ LA CURGEREA FLUIDELOR ÎN INTERIORUL ȚEVILOR	THEIL H., LAZA I., NAGI M., <u>SUSAN-RESIGA R.</u>	Simpozion de Termotehnică și Mașini Termice, Timișoara, 1988, Vol. I, pp. 63-70.
12.	STABILIREA SOLUȚIEI OPTIME DIN PUNCT DE VEDERE ENERGETIC ȘI AL GABARITULUI UNUI SCHIMBĂTOR DE CĂLDURĂ CU FASCICOL DE ȚEVI ÎN MANTA	LAZA I., <u>SUSAN-RESIGA R.</u> , THEIL H., NAGI M.	Simpozion de Termotehnică și Mașini Termice, Timișoara, 1988, Vol. I, pp. 59-62.
13.	PROIECTAREA ASISTATĂ DE CALCULATOR A SCHIMBĂTOARELOR DE CĂLDURĂ CU FASCICOL DE ȚEVI ÎN MANTA	<u>SUSAN-RESIGA R.</u> , THEIL H., LAZA I.	Simpozion de Termotehnică și Mașini Termice, Timișoara, 1988, Vol. I, pp. 75-82

## Research Grants/ Contracts

### International Projects

	Number / year	Title	Beneficiary
1.	Ctr. 1/2011	Modelling and optimization of the swirling flow ingested by the draft tube of a Francis turbine within an operating range	ALSTOM Power Hydro, France
2.	Ctr. 5214/19.04.2007	Taming the Vortex Rope project-TAVORO	General Electric, Canada
3.	UPT 6/23.11.2005 SCOPE Joint Research Project IB7320-110942, 2005-2008	TURBOMACHINERY SWIRLING FLOW OPTIMIZATION AND CONTROL WITH TECHNOLOGY OF MAGNETORHEOLOGICAL SYSTEMS	Swiss National Science Foundation, EPFL
4.	UPT 16126/ 21.12.2005, SIEMENS VDO 1521266/17.11.2005	THERMO-HYDRODYNAMIC OPTIMIZATION OF A COOLING CELL WITH PARTIAL CROSS WALLS	SIEMENS VDO Automotive Germany
5.	UPT 16126/ 21.12.2005, SIEMENS VDO 1510787/01.09.2005	NUMERICAL ANALYSIS OF A COOLING CELL HYDRODYNAMICS	SIEMENS VDO Automotive Germany
6.	UPT Nr. 1/01.03.05	RHEOLOGICAL INVESTIGATIONS OF POLYMER SAMPLES UNDER CONTROLLED INERT ATMOSPHERE	EZUS Lyon, France

### National Grants

	Number / year	Title	Beneficiary
1.	PROIECT PN2, CTR. 21/2007, 2007-2009	CERCETARI DE REALIZARE SOFT CFD SI MODEL FUNCTIONAL ORIGINAL SISTEM POSTCOMBUSTIE, CU VALIDAREA REZULTATELOR - POSTCOMB	CNMP
2.	PROIECT CEEX-X2C16/2006. 2006-2008	MODELE SI METODE NUMERICE AVANSATE IN INGINERIA NAVELOR DE TRANSPORT GAZE LICHEFIATE - MARGAS	IPA
3.	PROIECT CEEX C_X2C05/3, 2006-2008	HIDRODINAMICA SI TRANSFERUL DE MASA LA COLOANE DE BULE FINE CU APLICARE IN TEHNOLOGII AVANSATE DE MEDIU - TEHNOMED	IPA



4.	PROIECT CEEX, CTR. 192/2006, 2006-2008	INTERINFLUENȚA TURBINELOR HIDRAULICE STABILIZATE CU AX DE ROTATȚE VERTICAL DE TIP ACHARD - THARVEST	AMCSIT
5.	PROIECT CEEX-M1-C2-1185, Contract 9223/24.07.2006, 2006-2008	INTEGRAREA TEHNOLOGIILOR MAGNETO-REOLOGICE SPECIALE ȘI AL CONTROLULUI AVANSAT AL CURGERII ÎN APLICAȚII INDUSTRIALE - ISMART-FLOW	MAHNANTECH
6.	PROIECT CEEX-M1-C2-1180, CTR 81/2006, 2006-2008	OPTIMIZAREA COMPUTERIZATĂ A PROCESULUI DE DIAGNOSTIC INTERVENȚIE TERAPEUTICĂ ȘI PROGNOSTIC A BOLILOR CARDIOVASCULARE - CARDIOCOMP	VIASAN
7.	Grant CNCISIS tip A, COD CNCISIS 730, 2005-2007	DEZVOLTAREA DE MODELE MATEMATICE ȘI NUMERICE PENTRU CURGEREA CAVITAȚIONALĂ BIFAZICĂ CU APLICAȚII INDUSTRIALE ȘI BIOMEDICALE	CNCISIS
8.	GRANT CNCISIS A-CONSORTIU, COD CNCISIS 33, 2005-2007	HIDRODINAMICA VÂRTEJURILOR ȘI APLICAȚII	CNCISIS
9.	GRANT CNCISIS A COD CNCISIS 109/2002, 29/2003, 24/2004	METODE MODERNE DE CALCUL PARALEL PENTRU SIMULAREA NUMERICĂ A CURGERII FLUIDELOR ȘI APLICAȚII LA MAȘINI ȘI SISTEME HIDROPNEUMATICE	CNCISIS
10.	GRANTUL ACADEMIEI ROMÂNE GAR 362/2003, 103/2004	MODELAREA NUMERICĂ ȘI ANALIZA CURGERILOR CAVITAȚIONALE BIFAZICE ÎN TURBINELE HIDRAULICE	Academia Română
11.	GRANT CNCISIS A COD CNCISIS 730/2005	DEZVOLTAREA DE MODELE MATEMATICE SI NUMERICE PENTRU CURGEREA CAVITATIONALA BIFAZICA CU APLICATII INDUSTRIALE SI BIOMEDICALE	CNCISIS
12.	PROIECT CEEX PC-D03-PT00-641, 2005	MEDIOGRID – PRELUCRAREA GRAFICĂ PARALELĂ ȘI DISTRIBUITĂ PE STRUCTURA GRID A DATELOR GEOGRAFICE ȘI DE MEDIU	MCT
13.	GRANT MEN 32221/2000 COD C.N.C.S.I.S. 11	BCUM : CENTRUL NAȚIONAL PENTRU INGINERIA SISTEMELOR CU FLUIDE COMPLEXE	C.N.C.S.I.S.
14.	C.N.F.I.S. COD 145	MODERNIZAREA ȘI DEZVOLTAREA ÎNVĂȚĂRII MECANICII FLUIDELOR ȘI HIDRAULICII	C.N.F.I.S

15.	GAR NR. 81/2001	ANALIZA NUMERICĂ A CURGERII CUPLATE TRIDIMENSIONALE ÎN DISTRIBUTORUL ȘI ROTORUL TURBINELOR FRANCIS	Academia Română
16.	GRANT ANSTI-S, CONTRACT 6153/2000, TEMA B-22	ANALIZA NUMERICĂ CU METODA ELEMENTULUI FINIT A CURGERII POTENȚIALE TRIDIMENSIONALE IN TURBOMASINILE AXIALE	A.N.S.T.I.
17.	GRANT ANSTI-S, CONTRACT 6153/2000, TEMA B-39	DEZVOLTAREA DE SOFTWARE INTERACTIV PT. SIMULAREA NUMERICĂ ȘI ANALIZA CURGERILOR INCOMPRESIBILE PESTE PROFILE AERO/HIDRODINAMICE SINGULARE SAU ÎN REȚEA	A.N.S.T.I.
18.	GRANT ANSTI-C, NR. 6142/19.10.2000	ANALIZA NUMERICĂ A CURGERII ÎN REȚELE RADIALE DE PROFILE DISPUSE ÎN TANDEM	A.N.S.T.I.
19.	GAR NR. 120/1999	ANALIZA NUMERICĂ A CURGERII CU DESPRINDERI ÎN REȚELE PLANE DE PROFILE	Academia Română
20.	CONTRACT NR. 91/1996, ACT ADIȚIONAL NR. 128 DIN 10.05.1999	STUDII TEORETICE ȘI CERCETĂRI EXPERIMENTALE ASUPRA COMPORTĂRII UNOR FLUIDE COMPLEXE ÎN CONDIȚII DE MICROGRAVITAȚIE. PROPUNERE DE EXPERIMENT PE STAȚIA SPAȚIALĂ INTERNAȚIONALĂ, FAZA B1.2	A.N.S.T.I.

### National Contracts

	Number / year	Title	Beneficiary
1.	UPT NR. 147/15.10.2008	Numerical Simulation of the Pump Hydrodynamics with Heat Transfer	S.C. ZOPPAS Industries Romania
2.	UPT NR.152/23.10.2008	Cercetari si experimentari privind imbunatatirea performantelor energetice si cavitationale ale pompelor PRO 10-195 de la statia de pompe Jidoaia	S.C. Hidroelectrica S.A, Ramnicu Valcea
3.	UPT NR.151/23.10.2008	Cercetari si experimentari privind cresterea performantelor turbinelor Francis 57.5-128.5 CHE Bradisor	S.C. Hidroelectrica S.A, Ramnicu Valcea
4.	UPT NR. 771/23.10.2007	Simulare si analiza Pompa MP3X	S.C.Hella Electronics S.R.L.
5.	AR NR.	Măsurarea pulsațiilor de presiune în conul tubului de aspirație, în regimuri de funcționare ale turbinei de la CHE	S.C Hidroelectrica S.A. Sucursala Cluj

	5007/27.06.2007	Munteni	
6.	AR NR. 58/04.10.2007.	Măsurarea pulsațiilor de presiune în conul tubului de aspirație, în regimuri de funcționare ale turbinei de la CHE Turnu Rueni	S.C Hidroelectrică S.A. Sucursala Caransebeș
7.	AR NR. 423/13.06.2007	Simularea și analiza curgerii 3D prin rotorul relaționist de mare capacitate	S.C. TehnoVil-Erudit, Ramnicu Valcea
8.	AR NR. 9875/30.11.2007	Studii privind analiza numerică a curgerii în traseul hidraulic al CHF Munteni ce urmărește determinarea încărcării pe paletel rotative în punctele de funcționare în care turbina operează cel mai frecvent	S.C Hidroelectrică S.A. Sucursala Cluj
9.	UPT NR. 7380309/2007	Studii privind comportarea și exploatarea echipamentelor hidroenergetice	S.C. Hidroelectrică S.A. Ramnicu --Valcea
10.	UPT 462/25.05.2006	NUMERICAL SIMULATION OF HEAT CONVECTION AND RADIATION FOR A DRYER HEATING SYSTEM IN DIFFERENT CONFIGURATIONS	S.C. ZOPPAS INDUSTRIES
11.	UPT NR. 380/20.12.2005	SIMULAREA NUMERICĂ A CURGERII APEI PRIN ROTORUL TURBINEI RETEHOLOGIZATE DE LA CHE PORȚILE DE FIER I ȘI DETERMINAREA DISTRIBUȚIEI DE PRESIUNI PE PALETĂ	Centrul de Cercetări în Hidraulică, Automatizări și Procese Termice,  CCHAPT Reșița
12.	UPT NR.343/ 27.10.2005	ASPECTE ALE COMPORTĂRII PLASTICE ȘI ELASTICE ALE SOLURILOR ALCOXIDICE ÎN TIMPUL TRANZIȚIEI DE LA SOL LA GEL	Institutul de Chimie al Academiei Române – Filiala Timișoara
13.	UPT NR.325/ 27.09.2005	CONSULTANȚA ȘI EXPERTIZA TEHNICĂ PENTRU SIMULARE NUMERICĂ ȘI ANALIZA CURGERII CU TRANSFER TERMIC ÎN ECHIPAMENTE DE USCARE PET	S.C. ZOPPAS Industries Romania
14.	UPT NR. 320/19.09.2005	NUMERICAL SIMULATION OF FLOW WITH HEAT CONVECTION AND RADIATION FOR A DRYER HEATING SYSTEM	S.C. ZOPPAS Industries Romania
15.	UPT NR. 213/20.01.2005	ANALIZA NUMERICĂ ÎN AFARA PUNCTULUI OPTIM DE FUNCȚIONARE A TURBINEI FRANCIS RECONT $n_s^{kW} = 285$ .	Recont S.A.
16.	UPT 212/20.01.2005	ANALIZA SOLUȚIEI TEHNICE EXISTENTĂ PENTRU MOTORUL ELECTRIC DE CURENT CONTINUU TIP C990/440-6-2 DE 1600 KW, 750 V, 1000 RPM CU EVALUAREA SOLICITĂRILOR TERMO-MECANICE DIN COLLECTOR RESPECTIVE AL FUNCȚIONĂRII SISTEMULUI DE VENTILAȚIE ȘI RĂCIRE.	U.C.M. Reșița S.A.

17.	AR NR. 164-12.02/ 05.08.2004	DETERMINAREA DEBITULUI TURBINAT PRIN TRASEUL HIDRAULIC AL HIDROAGREGATELOR DE LA CHE GURA LOTRULUI, TURNU ȘI DĂIEȘTI	Hidroelectrica S.A., Sucursala Rm. Vâlcea
18.	UPT NR. 76/19.05.2004	DETERMINAREA CARACTERISTICILOR REALE DE FUNCȚIONARE ALE HIDRO-AGREGATELOR DE LA STAȚIILE DE POMPARE PETRIMANU, JIDOAIA ȘI LOTRU AVAL	Hidroelectrica S.A., Sucursala Rm. Vâlcea
19.	AR NR. 90- 12.02/05.05.2004	STABILIREA POZIȚIEI PALETELOR LA STATORUL TURBINEI HIDRO-AGREGATULUI ZĂVIDENI ÎN OPTIMIZĂRII CURGERII APEI PRIN ACESTA	Hidroelectrica S.A., Sucursala Rm. Vâlcea
20.	UPT NR. 165/27.10.2004	DETERMINĂRI MAGNETICE ȘI REOLOGICE	Institutul de Chimie al Academiei Române – Filiala Timișoara
21.	UPT NR. 164/27.10.2004	DETERMINĂRI REOLOGICE	Institutul de Chimie al Academiei Române – Filiala Timișoara
22.	UPT NR. 155/29.09.2004	SIMULAREA NUMERICĂ ȘI ANALIZA FENOMENULUI CURGERII CU TRANSFER TERMIC PRIN CONVECȚIE ȘI RADIAȚIE PENTRU REZISTENȚA ELECTRICĂ A MAȘINII DE SPĂLAT	ZOPPAS Industries Romania
23.	UPT NR. 54/16.04.2004	ANALIZA CFD ÎN PUNCTUAL OPTIM DE FUNCȚIONARE A TURBINEI FRANCIS CU RAPIDITATE $n_s^{kW} = 285$ .	Recont S.A.
24.	UPT NR. 44/30.03.2004	SIMULAREA NUMERICĂ ȘI ANALIZA FENOMENULUI CURGERII 3D CU RADIAȚIE ȘI CONVECȚIE NATURALĂ PENTRU A REZISTENȚĂ ELECTRICĂ DATĂ	ZOPPAS Industries Romania
25.	UPT NR. 10/21.01.2004	ANALIZA CURGERII ȘI OPTIMIZAREA RĂCIRII ÎN CIRCUITUL INTERIOR DE VENTILAȚIE AL MOTORULUI ASINCRON CU ROTORUL ÎN SCURT-CIRCUIT TIP TIS 1350/430-6 DE 420 KW, 690 V, 215-430 RPM.	U.C.M. Reșița S.A.
26.	UPT NR. 1228/ 16.12.2003	SIMULAREA NUMERICĂ ȘI ANALIZA FENOMENULUI CURGERII 3D CU CONVECȚIE NATURALĂ PRIN CUTIA TERMOSTATULUI CE ECHIPEAZĂ RADIATOARELE ELECTRICE	ZOPPAS Industries Romania
27.	UPT NR. 1221/ 13.11.2003	ASPECTE ALE COMPORTĂRII REOLOGICE ALE GELURILOR POLIMERICE	Institutul de Chimie al Academiei Române – Filiala Timișoara
28.	UPT NR. 1204/ 23.10.2003	SIMULAREA NUMERICĂ ȘI ANALIZA FENOMENULUI CURGERII COMPRESIBILE TURBULENTE PENTRU VARIANTA 2D AXIAL-SIMETRICĂ CU SCHIMB DE	ZOPPAS Industries Romania

		CĂLDURĂ PENTRU STICLELE TIP PET, AVÂND TIJA DE DISTRIBUȚIE A AERULUI DE RĂCIRE DE Ø12MM.	
29.	AR NR. 23-77.03-146/ 09.04.2003	ANALIZA COMPARATIVĂ A DOUĂ POZIȚII ALE COLOANELOR STATORICE ȘI INFLUENȚA ASUPRA CÂMPULUI HIDRODINAMIC DIN ROTORUL TURBINEI KAPLAN DE LA CHE DRĂGĂȘANI	Hidroelectrica S.A., Sucursala Rm. Vâlcea
30.	UPT NR. 1182/ 20.10.2003	DETERMINAREA PROPRIETĂȚILOR REOLOGICE ALE ȚIȚEIURILOR ADITIVATE CU POLIMERI	U.P.B., Centrul de Cercetări Energetice și de Protecția Mediului
31.	UPT NR. 1164/ 07.08.2003	SIMULAREA NUMERICĂ ȘI ANALIZA FENOMENULUI CURGERII TURBULENTE PENTRU VARIANTA 2D AXIAL-SIMETRICĂ CU SCHIMB DE CĂLDURĂ PENTRU STICLELE DE TIP PET	ZOPPAS Industries Romania
32.	UPT Nr. 991/04.11.2002	DETERMINAREA PROPRIETATILOR REOLOGICE DE CURGERE ALE FLUIDULUI DE FORAJ CU MICROBULE	I.C.P.T. Câmpina
33.	UPT Nr. 958/05.09.2002	NUMERICAL SIMULATION AND ANALYSIS OF THE POLYETHYLENE TEREPHTHALATE FLOW IN 72 CAVITIES HOT-RUNNER CONFIGURATION TAKING INTO ACCOUNT THE VARIABLE PET VISCOSITY	ZOPPAS Industries – Romania
34.	UPT Nr. 942/17.07.2002	NUMERICAL SIMULATION AND ANALYSIS OF THE POLYETHYLENE TEREPHTHALATE FLOW IN NEW HOT RUNNER CONFIGURATION TAKING INTO ACCOUNT THE VARIABLE PET VISCOSITY	ZOPPAS Industries – Romania
35.	UPT Nr. 750/24.10.2001	STUDII NUMERICE ALE PROCEDEELOR RESTAURATIVE DIRECTE ȘI INDIRECTE ALE APARATULUI DENTO-MAXILAR CU MATERIALE HETEROGENE	Universitatea de Medicină și Farmacie Timișoara
36.	UPT Nr. 439/1999	MĂSURAREA VITEZEI DE CIRCULAȚIE A AERULUI INDUSĂ DE INSTALAȚIA DE CLIMATIZARE	SOLECTRON Timișoara
37.	UPT Nr. 91/1991	SOLUȚII CONSTRUCTIVE PENTRU MULTIPLICATORUL DE PRESIUNE APARTINAND INSTALAȚIEI DE TĂIERE CU JET DE LICHID	I.C.P.M. Deva
38.	UPT nr. 77/1990	CERCETĂRI TEORETICE ȘI FUNDAMENTAREA CERCETĂRILOR DE LABORATOR, PRIVIND TĂIEREA CU JET DE LICHID	I.C.I.T.P.L.C.I.M. Deva