

# ATTRACTION OF YOUNG PEOPLE TOWARD SCIENCE – STRATEGIC WISH OF THE KNOWLEDGE SOCIETY



***Bucharest, ROMANIA  
21 – 22 of June, 2018***

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**National Institute for Research and Development in  
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## Wednesday

June 20, 2018

**15:00 – 18:00** Accommodation at the AMBASADOR Hotel. Preliminary information

**19:00 – 21:00 Symphonic and choir concert at the Romanian Athenaeum**

Doncescu; Edvard Grieg - Concerto in minor for piano and orchestra, op. 16; Johannes Brahms - Symphony no. 4, in minor, op. 98 – conductor Horia Andreescu, conductor of the choir Iosif Ion Prunner

## Thursday

June 21, 2018

**Conference Hall of AMBASADOR Hotel**

**08:30 – 09:30** Registration of participants

**09:30 – 10:00** Opening Ceremony

**10:00 – 11:30** Plenary Session

**11:30 – 11:45** Coffee/Tea Break

**11:45 – 14:00** Plenary Sessions

**14:00 – 15:00** Lunch

**15:00 – 16:30** Visit to INCDIE ICPE-CA

**16:30 – 17:30** Round table

**19:00 – 21:00** Cocktail

## Friday

June 22, 2018

**Conference Hall of AMBASADOR Hotel**

**08:30 – 10:00** Plenary Session

**10:00 – 10:15** Coffee/Tea Break

**10:15 – 13:30** Plenary Sessions

**13:30 – 14:00** Closing Ceremony

**14:00 – 15:00** Lunch

**15:00 - 17:00** Departure

**Thursday, June 21, 2018**

## ***Plenary Session I***

***Policies to motivate / attract / promote young people for research career and the impact on the labor market and competitiveness***

**10:00 – 11:30**

**MODERATORS: Vasilica CIUCĂ and Chen MIN HSU**

### **SCIENCE, FICTION AND FUTURE**

**Cristian-Mihail TEODORESCU<sup>1</sup>, Cristina GHIDOVEANU<sup>2</sup>**

<sup>1</sup>National Institute of Materials Physics, Magurele, ROMANIA

<sup>2</sup>Freelancer Translator and Journalist, ROMANIA

### **THE CONTRIBUTION OF PNCDI 2 PROGRAMS TO THE DEVELOPMENT OF YOUNG RESEARCHERS' CAREERS**

**Eva MILITARU, Madalina POPESCU, Ana-Maria ZAMFIR, Cristina MOCANU, Speranta PÎRCIOG, Amalia CRISTESCU**

National Scientific Research Institute for Labour and Social Protection, Bucharest, ROMANIA

### **IMPRESSIONS ABOUT ALEXANDRU PROCA CENTER FOR THE INITIATION OF YOUTH IN SCIENTIFIC RESEARCH**

**Dan-Andrei CORBEANU**

IMT Bremen, GERMANY

### **INTERNATIONAL SCIENTIFIC EVENTS AND PUBLICATIONS TRIGGERS FOR AN ACADEMIC AND RESEARCH CAREER**

**Adriana GRIGORESCU**

National University of Political Studies and Public Administration, Bucharest, ROMANIA

Correspondent Member of the Academy of Romanian Scientists

### **A SPATIAL ANALYSIS OF YOUTH RESEARCHERS IN ROMANIA**

**Speranța PÎRCIOG, Vasilica CIUCĂ, Cristina LINCARU, Draga ATANASIU**

National Scientific Research Institute for Labor and Social Protection - INCSMPS, Bucharest, ROMANIA

**11:00 – 11:45 Coffee/Tea Break**



## ***Plenary Session II***

### ***Good practice models - success stories in attracting students toward scientific research***

11:45 – 13:00

**MODERATORS:** Detlef BONFERT and Ana-Maria ZAMFIR

#### **THE “SPACE FOR SCIENCE” PUBLIC OUTREACH PROGRAMME**

**Cristian Dumitru IONESCU, Toma ROMAN, Sorin ZGURA**

Institute of Space Science, Bucharest, ROMANIA

#### **METHODS OF INITIATING HIGH SCHOOL STUDENTS AND YOUNG PEOPLE INTO RESEARCH- A CASE STUDY UPON ALEXANDRU PROCA CENTRE OF SCIENTIFIC RESEAR**

**Andra Maria CIUTAC**

Manchester University of Medicine, ENGLAND

#### **FASCINATION OF ROBOTICS**

**Mihaela Ramona POTERA, Florin Constantin SERBU**

“Carmen Sylva” Theoretical High School, Eforie Sud, ROMANIA

#### **LEARNING (ABOUT) SCIENCE IN THE EARLY AGE. LESSONS FROM THE MAKEY PROJECT**

**Anca VELICU<sup>1</sup>, Monica MITARCA<sup>2</sup>**

<sup>1</sup>Institute of Sociology, Romanian Academy, Bucharest, ROMANIA

<sup>2</sup>Dimitrie Cantemir Christian University, Bucharest, ROMANIA

#### **SUPPORTING YOUNG RESEARCHERS IN THE REPUBLIC OF MOLDOVA: PROBLEMS AND OPPORTUNITIES**

**Alexandru GRIBINCEA**

Moldova State University, Chisinau, MOLDOVA

## **Plenary Session III**

### **Good practice models - success stories in attracting students toward scientific research**

13:00 – 14:00

**MODERATORS:** Harry MINȚI and Adriana GRIGORESCU

#### **NEW APPROACHES TO ATTRACTING YOUNG PEOPLE TO SCIENCE, SCIENTIFIC RESEARCH AND TECHNOLOGICAL DEVELOPMENT:**

- POLICIES TO MOTIVATE / ATTRACT / PROMOTE YOUNG PEOPLE FOR A CAREER AS A RESEARCHER;
- TRAINING MODELS FOR SCIENTIFIC RESEARCH;
- GOOD PRACTICES AND SUCCESS STORIES IN ATTRACTING TO RESEARCH AND INNOVATION

**Gheorghe Ion GHEORGHE, Iulian ILIE, Octavia CARUNTU**

National Institute of Research and Development in Mechatronics and Measurement Technique – INCDMTM, Bucharest, ROMANIA

#### **ATTRACTING YOUNG PEOPLE TO SCIENCE AND RESEARCH AT FRAUNHOFER**

**Detlef BONFERT<sup>1</sup>, Birgit GEISELBRECHTINGER<sup>2</sup>, Dieter HEMMETZBERGER<sup>1</sup>, Christof LANDEBERGER<sup>1</sup>, Christoph KUTTER<sup>1</sup>**

<sup>1</sup>Fraunhofer Research Institution for Microsystems and Solid-State Technologies EMFT, Munich, GERMANY

<sup>2</sup>Fraunhofer Society, Munich, GERMANY

#### **SKILLS FOR EARLY CAREER RESEARCHERS- A TEXT MINING APPROACH**

**Monica Mihaela MAER MATEI, Ana-Maria ZAMFIR, Cristina MOCANU**

National Scientific Research Institute for Labour and Social Protection, Bucharest, ROMANIA

#### **SELF-KNOWLEDGE AS AN ESSENTIAL STEP IN SUCCESSFUL ELECTRICAL ENGINEERING EDUCATION**

**Beatrice GHITA, Elena HELEREA, Simona Elena INDREICA**

Transilvania University of Brasov, ROMANIA

14:00 – 15:00 Lunch

15:00 – 16:30

**Visit to INCDIE ICPE-CA**

16:30 – 17:30 Round table

**Moderators: Alexandru MIRONOV and Dan MILICI**

#### **SUPPORTING YOUNG PEOPLE TO STEM TRAINING**

19:00 – 21:00 Cocktail

**Friday, September 22, 2018**

***Plenary Session IV***

***Policies to motivate / attract / promote young people for research career and the impact on the labor market and competitiveness***

**8:30 – 10:00**

**MODERATORS: Speranța PÎRCIOG and Cen MIN**

**POLICIES TO ATTRACT YOUNG PEOPLE FOR RESEARCH CAREER: THE ITALIAN CASE**

**Marco RAGAZZI**

University of Trento, Trento, ITALY

**POLICIES TO UNLEASH THE INNOVATION DRIVEN ECONOMY IN OUR COUNTRY AND ATTRACTING THE YOUTH TOWARD THIS SOCIO ECONOMIC PARADIGM**

**Alexandru BORCEA**

ARIES, Bucharest, ROMANIA

**TALKING ABOUT SCIENCE IN THE EUROPEAN UNION. A LONGITUDINAL APPROACH OF THE EUROBAROMETER SURVEYS**

**Valentina PRICOPIE**

Institute of Sociology, Romanian Academy, Bucharest, ROMANIA

**SURVEY OF THE ENVIRONMENT**

**Harry MINTI**

Hebrew University of Jerusalem, ISRAEL

**REIMAGING THE PAST. ROMANIAN STUDENTS REPRESENTATION OF COMMUNISM VIA BIC70 PROJECT**

**Valentina PRICOPIE, Cristina DÂMBOEANU**

Institute of Sociology, Romanian Academy, Bucharest, ROMANIA

**10:00 – 10:15 Coffee/Tea Break**

## **Plenary Session V**

### ***The role of the technical museum in attracting and training young people to / in the field of engineering***

10:15 – 11:15

**MODERATORS: Gabriela IONESCU and Aurel TUDORACHE**

#### **„THE TRIUMPH OF BAKELITE” – A MUSEUM TO ATTRACT YOUNG PEOPLE TOWARD SCIENCE**

**Elena HELEREA<sup>1</sup>, Maria Elvira CALLAPEZ<sup>2</sup>**

<sup>1</sup>Transilvania University of Brasov, Brasov, ROMANIA

<sup>2</sup>University of Lisbon, Lisbon, PORTUGAL

#### **EDUCATIONAL PROJECTS TO ATTRACT STUDENTS INTO ENGINEERING**

**Aurel TUDORACHE**

Technical Museum UPB, Bucharest, ROMANIA

#### **DEVELOPMENT OF ABILITIES IN THE FIELD OF INNOVATION AND INVENTIONS THROUGH CREATIVE EDUCATION**

**L. Dan MILICI<sup>1</sup>, Victor SUTAC<sup>2</sup>, Anca GRECULEAC<sup>3</sup>**

<sup>1</sup>Stefan cel Mare University of Suceava, ROMANIA

<sup>2</sup>Cygnus Scientific Society – UNESCO Center, ROMANIA

<sup>3</sup>Petru Rares National Colledge, Suceava, ROMANIA

<sup>1,2</sup>MILSET ROMANIA

#### **THE ONGOING YOUNG PEOPLE MOVING OUT OF THE TAIWAN ECONOMY: PROBLEM ANALYSIS AND SOLUTION CAPABILITY**

**Chen MIN HSU**

CEO, Center for Mobile Banking - CTCB Business School, Tainan, TAIWAN

#### **GEOLOCATION AND SOCIAL MEDIA FOR ENHANCED RECRUITMENT CAMPAIGNS FOR YOUNG PEOPLE**

**George SUCIU<sup>1</sup>, Adrian PASAT<sup>1</sup>, Carmen NADRAG<sup>1</sup>, Cristina BALACEANU<sup>1</sup>**

<sup>1</sup>Beia Consult International, R&D Department, Bucharest, ROMANIA

# ***Plenary Session VI***

## ***Models and training structures for scientific research***

**11:15 – 13:30**

**MODERATORS: Nikolay MIHAILOV and Mircea IGNAT**

### **MEMBERSHIP FUNCTIONS COMPUTATION IN REAL HILBERT SPACES**

**Mircea SULARIA**

University Politehnica of Bucharest, ROMANIA

### **INDUSTRY 4.0 AND YOUTH EMPLOYABILITY**

**Hakan ERCAN**

TURKEY

### **DO YOU SPEAK SCIENCE? HOW RESEARCHERS AND PUPILS CAN LEARN FROM EACH OTHER ABOUT SCIENCE**

**Ionuț TOPALĂ<sup>1</sup>, Cătălin AGHEORGHISEI<sup>1</sup>, Mădălina COCEA<sup>2</sup>**

<sup>1</sup>Iasi Plasma Advanced Research Center (IPARC), Alexandru Ioan Cuza University of Iasi, ROMANIA

<sup>2</sup>Department for Student Services and Alumni Affairs (DSSA), Alexandru Ioan Cuza University of Iasi, ROMANIA

### **YOUNG PEOPLE ATTRACTING FOR THE SCIENTIFIC RESEARCH ACTIVITY IN THE MODERN BRANCHES OF TECHNOLOGY**

**M. GHEORGHE**

NANOM MEMS SRL, Râșnov, ROMANIA

### **'CLINICAL' PERSONALITY TRAITS IN HIGHLY CREATIVE POTENTIAL RESEARCHERS AND ARTISTS**

**Marius M. STANCIU**

University of Bucharest, ROMANIA

### **COMENTARIES ABOUT THE BUILDING OF THE SCIENTIFIC RESEARCH CENTRE ON THE INITIATION OF THE LYCEUM STUDENTS**

**Mircea IGNAT**

National Institute for Research and Development in Electrical Engineering ICPE – CA, Bucharest, ROMANIA

### **EVOLUTION OF THE DEVELOPMENT OF SCIENCE IN THE REPUBLIC OF MOLDOVA AND THE CURRENT STATE OF SUPPORT OF YOUNG PEOPLE IN THE RESEARCH ACTIVITY**

**Ghenadie CIOBANU**

INCSMPS, Bucharest, ROMANIA

**13:30 – 14:00 Closing Ceremony**

**14:00 – 15:00 Lunch**

# ABSTRACTS

## 1. SCIENCE, FICTION AND FUTURE

**Cristian-Mihail TEODORESCU<sup>1</sup>, Cristina GHIDOVEANU<sup>2</sup>**

<sup>1</sup>National Institute of Materials Physics, Magurele, ROMANIA

<sup>2</sup>Freelancer Translator and Journalist, ROMANIA

### **Abstract**

in 1865, French author Jules Verne published the novel *from the earth to the moon*, which contains the first realistic (for that time) depiction of space travel. This was not just coincidence; his cousin, Henri Garcet, a mathematician, helped him with the scientific parts of the novel. The book was a great success, and among its readers were such people as Hermann Oberth, Konstantin Tsiolkovsky and Robert Goddard. So, the circle closes after a little more than a century, in 1969, and the rest is history.

This is maybe the first, but not the last example when science influences fiction, and the fiction inspires scientists. It has happened often since 1865: many science fiction writers have been scientists, and many scientists have chosen their career after reading science fiction in their youth. There is no doubt: science and imagination need one another to shape the future.

**Keywords:** scientists, writers, science fiction, future

## 2. THE CONTRIBUTION OF PNCDI 2 PROGRAMS TO THE DEVELOPMENT OF YOUNG RESEARCHERS' CAREERS

**Eva MILITARU, Mădălina POPESCU, Ana-Maria ZAMFIR, Cristina MOCANU, Speranța PÎRCIOG, Amalia CRISTESCU**

National Scientific Research Institute for Labour and Social Protection, Bucharest, ROMANIA

### **Abstract**

This paper aims to analyse the contribution of specific programs included in the National Plan for Research, Development and Innovation for the period 2007-2013 (PNCDI 2) to the development of young researchers' careers in Romania. In particular, the focus will be on the Post-doctoral research projects, as well as the Research projects to stimulate young independent teams, both aiming to support young people to develop their research career, the ultimate purpose being that of stimulating scientific excellence in Romanian research. Both quantitative and qualitative data was collected from young researchers participating to two competitions launched in 2012. An investigation was thus conducted in order to evaluate the main benefits generated by the participation to the above stated research programs and characteristics of further research careers of the participants.

**Keywords:** youth, research, career

### **References**

- Bloch, C., Graversen, E. K., Pedersen H. S. (2014) "Competitive Research Grants and Their Impact on Career Performance", *Minerva*, 52:77–96, DOI 10.1007/s11024-014-9247-0
- COST annual report (2017) "Building bridges of excellence for young researchers" [http://www.cost.eu/media/newsroom/cost\\_annual\\_report\\_2017](http://www.cost.eu/media/newsroom/cost_annual_report_2017)
- Ebadi, A. & Schiffauerova, A. (2016) "How to boost scientific production? A statistical analysis of research funding and other influencing factors", *A. Scientometrics*, 106: 1093, <https://doi.org/10.1007/s11192-015-1825-x>
- Friesenhahn, I. & Beaudry, C. (2014) *The Global State of Young Scientists – Project Report and Recommendations*, Berlin: AkademieVerlag.

### 3. IMPRESSIONS ABOUT ALEXANDRU PROCA CENTER FOR THE INITIATION OF YOUTH IN SCIENTIFIC RESEARCH

**Dan-Andrei CORBEANU**

IMT Bremen, GERMANY

#### **Abstract**

Presentation of the experience gained during the participation in the "Alexandru Proca" Center for youth initiation in scientific research, containing a history related to the creation of the youth groups that laid the foundations of the center, and continued experimentation and development of the center, from ideologies to the preparation of young people for research.

### 4. INTERNATIONAL SCIENTIFIC EVENTS AND PUBLICATIONS TRIGGERS FOR AN ACADEMIC AND RESEARCH CAREER

**Adriana GRIGORESCU**

National University of Political Studies and Public Administration, Bucharest, ROMANIA

Correspondent Member of the Academy of Romanian Scientists

#### **Abstract**

The cooperation with partners abroad, give us the opportunity to organize several international events as: conference, seminars, workshops etc. The involvement of the students as organizers gives them the free access to the debates and to the special track or session for them. The experience to present the opinion in public and the chance to publish a paper could be a trigger for a student to consider an academic or research career. The paper will present best practice and experience of the cooperation with the Chinese partners, lessons learned and techniques to be used in determining the youth embrace this career. There will be analyzed factors that are motivating the decision and increase the loyalty of the human resources to maintain the same job for a medium and long term.

### 5. A SPATIAL ANALYSIS OF YOUTH RESEARCHERS IN ROMANIA

**Speranța PÎRCIOG, Vasilica CIUCĂ, Cristina LINCARU, Draga ATANASIU**

National Scientific Research Institute for Labor and Social Protection - INCSMPS, Bucharest, ROMANIA

#### **Abstract**

Under the New Economic Geography and Evolutionary Economy framework we make a spatial analysis of the youth researchers in Romania. The youth researcher's presences in urban locations predict according to Moretti's (2012) the sustainability of the engine of economic growth. We profile the salaried employment in "R&D activities ISIC 4/ United Nations respectively 72 NACE (Act 72) classification/ INS Romania), at NUTS5 level, using 2011 RPL microdata provided by INS. Applying Univariate Local Moran's, calculated in GeoDa 1.10.0.8 (Anselin 2003, 2005, 2016) reveals for Romania a pronounced clustering tendency for this division, pattern illustrated in Choropleth maps made in ARC GIS. For any competitive city, **the human capital is a top priority** (World Bank, 2015, p.45) as the foundation for its growth policy and to the attraction of the investors.

#### **References**

Anselin, Luc., 2016. GeoDA 1.8.1. GeoDA Workshop Part I, Center for Spatial Data Science, University of Chicago, 2016.

Anselin, Luc: Exploring Spatial Data with GeoDa™: A Workbook, Center for Spatially Integrated Social Science, Illinois, and U.S.A, 2005. Available at: <https://geodacenter.asu.edu/system/files/geodaworkbook.pdf>.

Anselin, Luc: GeoDa™ 0.9 User's Guide, Spatial Analysis Laboratory, Department of Agricultural and Consumer Economics University of Illinois, Urbana-Champaign, Urbana, IL 61801, 2003. Available at: <http://sal.agecon.uiuc.edu/> and Center for Spatially Integrated Social Science <http://www.csiss.org/>, Revised, June 15, 2003.

Moretti, Enrico: The New Geography of Jobs, Houghton Mifflin Harcourt, Boston, New York, 2012.

## **6. THE “SPACE FOR SCIENCE” PUBLIC OUTREACH PROGRAMME**

**Cristian Dumitru IONESCU, Toma ROMAN, Sorin ZGURA**

Institute of Space Science, Bucharest, ROMANIA

### **Abstract**

Our philosophy is based on the premise that scientists should reach the public in an active and friendly manner, rather than just react to its opinions. Public education has to start with wonder, fascination and a sense of curiosity. Therefore, the scientific community relationship with the society must be at a conversational level, in a manner that inspires and attracts young minds, especially towards the scientific endeavor. Such a task necessitates the involvement of mass-media, with frequent and short timed video podcasts that can be accessed through the internet or made available at TV stations, where they are inserted during a certain time interval. Their purpose is to offer more than just information, but to elicit curiosity, invite toward a dialog and bring forth a historical and developmental context of a certain research field. Such endeavor is being successfully undertaken by our “Space for Science” series.

**Keywords:** space, science, outreach, podcast, education.

## **7. METHODS OF INITIATING HIGH SCHOOL STUDENTS AND YOUNG PEOPLE INTO RESEARCH- A CASE STUDY UPON ALEXANDRU PROCA CENTRE OF SCIENTIFIC RESEAR**

**Andra Maria CIUTAC**

Manchester University of Medicine, ENGLAND

### **Abstract**

The paper presents elementary insights into the process of scientific initiation for young people. It will focus foremost upon the concepts that led to the formation of Alexandru Proca Centre, principles which are still followed to this day. Moreover, the process of initiation into research was methodically described. It follows a systematic approach, starting from a lecture concerning the overview of research and the general methodology, followed afterwards by regular work-shops. The final aim of this long initiation process is the successful participation of the Alexandru Proca Centre’s students to national and international contests and symposiums. Following this strict pattern of project and research making, the Initiation Centre has accumulated various awards and distinctions, which will be briefly mentioned. Lastly, a personal reflection regarding the experience in the Alexandru Proca Centre will also be presented. I can conclude that Romania has a desperate need of such Research opportunities targeting young audiences, as the ones provided by Alexandru Proca Centre.

## **8. FASCINATION OF ROBOTICS**

**Mihaela Ramona POTERA, Florin Constantin SERBU**

“Carmen Sylva” Theoretical High School, Eforie Sud, ROMANIA

### **Abstract**

In the last years, Robotics has been the leading subject of the "Carmen Sylva" High School in Eforie Sud. Robotics has been introduced into CDS at gymnasium and high school and in extracurricular education in the form of "Robotic Club" and "Saturday School".

The great advantage of Robotics is that it strongly motivates students. Learning is active, and the integration of knowledge from different disciplines is natural.

We started by participating in robotics courses in Europe and Romania. Then we purchased robotic kits and components. We were supported by school and sponsors. We organized



curricular and extracurricular learning activities and participated in STEM fairs in the country and around the world.

The projects and activities with the greatest impact among students were: Astro Pi, CanSat and Exo Ro, organized by ESA, ROSA and ESERO, First Tech Challenge and the science fair: INESPO in Netherlands, ISWEEEP and Intel ISEF in USA.

**Keywords:** Robotics, STEM

#### **References**

Making Things Talk, Tom Igoe, O'Reilly, 2007

Learn Raspberry Pi with Linux, Peter Membrey, David Hows, Technology in Action

## **9. LEARNING (ABOUT) SCIENCE IN THE EARLY AGE. LESSONS FROM THE MAKEY PROJECT**

**Anca VELICU<sup>1</sup>, Monica MITARCA<sup>2</sup>**

<sup>1</sup>Institute of Sociology, Romanian Academy, Bucharest, ROMANIA

<sup>2</sup>Dimitrie Cantemir Christian University, Bucharest, ROMANIA

#### **Abstract**

The purpose of this presentation is to explore how makerspaces and digital making relates to STEM education, as it is often taken for granted that making will create interest and learning in STEM. Based on a literature review that was undertaken in MakeY project, and also on the observation of the authors on the activities in a makerspace, we wanted to examine whether this position is supported by evidence.

The result of the literature review shows that at this point mainly qualitative methodologies have been employed. Although qualitative methodologies are suitable for understanding the phenomenon and grasping its meaning, it does not allow for more rigorous studies of learning outcomes or the factors leading to changes in attitudes or behavior. We also noticed that some studies focused on a single subject (e.g. math, Tillman et al., 2014), or on a key knowledge domain as being vital for STEM education in makerspaces (e.g. circuitry, Sheridan et al., 2014), while a majority stressed an interdisciplinary approach (Bevan et al. 2014, Sheridan et al. 2014).

## **10. SUPPORTING YOUNG RESEARCHERS IN THE REPUBLIC OF MOLDOVA: PROBLEMS AND OPPORTUNITIES**

**Alexandru GRIBINCEA**

Moldova State University, Chisinau, MOLDOVA

#### **Abstract**

The development of science in the Republic of Moldova is an imperative for the development process of the country. One of the priorities is to attract young people into research and to support young researchers even in the context of diminishing financial resources. Academic mobility for young people is a successful policy in the Republic of Moldova with visible results in supporting and promoting talented young people. The main contribution of this article is the assessment of the current situation, with reference to the Bologna objectives of these policies.

## **11. NEW APPROACHES TO ATTRACTING YOUNG PEOPLE TO SCIENCE, SCIENTIFIC RESEARCH AND TECHNOLOGICAL DEVELOPMENT:**

**• POLICIES TO MOTIVATE / ATTRACT / PROMOTE YOUNG PEOPLE FOR A CAREER AS A RESEARCHER;**

**• TRAINING MODELS FOR SCIENTIFIC RESEARCH;**

**• GOOD PRACTICES AND SUCCESS STORIES IN ATTRACTING TO RESEARCH AND INNOVATION**

**Gheorghe Ion GHEORGHE, Iulian ILIE, Octavia CARUNTU**

### Abstract

**New approaches** to attracting young people to science, scientific research, technology development and innovation include **mixes of strategic paradigms** of intelligent and beyond borders knowledge, on **policy architecture, models** and **good practices** and **success stories**.

**As policies** for motivation, attraction and promotion of young people for the research career can be included: **the power of example** in national, European and international research, **outstanding results** in excellence research, acquired **skills and competences**, adaptability to what are new and innovative, demonstrations of research laboratories, start-ups, spin-offs, etc.

**As models** for continuous training in scientific research can be used intelligent matrix programs and procedures to teach and assimilate the advanced and newly discovered knowledge, with feedback in the social reality and with economic and financial impact, industrial and educational practices in research laboratories and SMEs, etc.

**As good practices** and success stories in attracting to research and innovation, can be taken from the research of excellence and advanced technological innovation from the European and international level, as well as from Industry 4.0 and digital technology and innovation HUBs.

**Keywords:** New approaches; Mix of policies; New training models, strategic paradigms; Industrial and educational good practices; Success stories;

### References

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2. Council conclusions on measures to support early stage researchers, raise the attractiveness of scientific careers and foster investment in human potential in research and development, Council of the European Union, Brussels, 30 November 2016 (OR. en) <http://data.consilium.europa.eu/doc/document/ST-15013-2016-INIT/en/pdf>
3. EURAXESS - Researchers in Motion, a unique pan-European initiative <https://euraxess.ec.europa.eu/>
4. The Human Resources Strategy for Researchers HRS4R, The European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers <https://euraxess.ec.europa.eu/>
5. Marie Skłodowska - Curie Actions WebPage, grants for all stages of researchers' careers <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-skłodowska-curie-actions>

## 12. ATTRACTING YOUNG PEOPLE TO SCIENCE AND RESEARCH AT FRAUNHOFER

**Detlef BONFERT<sup>1</sup>, Birgit GEISELBRECHTINGER<sup>2</sup>, Dieter HEMMETZBERGER<sup>1</sup>, Christof LANDEBERGER<sup>1</sup>, Christoph KUTTER<sup>1</sup>**

<sup>1</sup>Fraunhofer Research Institution for Microsystems and Solid-State Technologies EMFT, Munich, GERMANY

<sup>2</sup>Fraunhofer Society, Munich, GERMANY

### Abstract

Research of practical utility lies at the heart of all activities pursued by the Fraunhofer Gesellschaft. With its clearly defined mission of application-oriented research and its focus on key technologies of relevance to the future, the Fraunhofer-Gesellschaft plays a prominent role in the German and European innovation process. Applied research has a knock-on effect that extends beyond the direct benefits perceived by the customer: through their research and development work, the Fraunhofer Institutes help reinforce the competitive strength of the economy in their local region, and throughout Germany and Europe.

As an employer, the Fraunhofer-Gesellschaft offers its staff the opportunity to develop the professional and personal skills that will allow them to take up positions of responsibility within their institute, at universities, in industry and society.

Students who choose to work on projects at the Fraunhofer Institutes have excellent prospects of starting and developing a career in industry by virtue of the practical training and experience they have acquired.

The Fraunhofer-Gesellschaft and its Institutes are also involved in attracting Young People to Science and Research through different programs.

The “Europäische Talent Akademie Lindau” supported by the “Arbeitsgemeinschaft Alpenländer (ARGE ALP) brought together for two weeks, talented, interested young people from the Alp-countries to develop their knowledge about nature, science, art and culture.

The Fraunhofer Talent School program offers hands-on workshops for young people to introduce them into the research activity.

Even for kids, Fraunhofer- Gesellschaft has a program: “Kids Kreativ”, a contest at „Kindergarden- Level“, to wake-up the research activity during playing.

**Keywords:** Fraunhofer, Young People, Science, Research, Talent School, Kids

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Kids Kreativ, URL: <https://www.fraunhofer.de/de/jobs-und-karriere/schueler/Nachwuchsprogramme/kleine-forscher/kids-kreativ.html>

### 13. SKILLS FOR EARLY CAREER RESEARCHERS- A TEXT MINING APPROACH

**Monica Mihaela MAER MATEI, Ana-Maria ZAMFIR, Cristina MOCANU**

National Scientific Research Institute for Labour and Social Protection, Bucharest, ROMANIA

#### Abstract

Identifying the skills necessary for getting and being successful in a job represents a major research objective in the field of job market analysis. The purpose of this paper is to extract information about skills needs in research jobs. The data is collected from Euraxess-Researchers in motion, a platform designed to deliver information and support services for researchers. This platform also serves as a recruitment tool for research positions. We analysed textual data coming from the description of required knowledge and competencies that are posted in the employers’ advertisements of the vacancies or in the calls for applications. From the set of available job offers the ones addressing to the first stage researchers were selected. We have analysed different research fields such as computer science, economics, agricultural sciences, chemistry, technology and we saw different patterns. The findings were revealed by text mining techniques and are presented as word clouds.

**Keywords:** job analysis, text mining, skills, research career

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### 14. SELF-KNOWLEDGE AS AN ESSENTIAL STEP IN SUCCESSFUL ELECTRICAL ENGINEERING EDUCATION

**Beatrice GHITA, Elena HELEREA, Simona Elena INDREICA**

Transilvania University of Brasov, ROMANIA

#### Abstract

In the last hundred and fifty years, electrical engineering has transformed the world we live in,

contributing to enhance life quality for world's population. Nowadays the electrical engineer role is more visible and well understood, although many young people still hesitate to embrace the engineering career.

The question is whether universities have enough data to substantiate appropriate strategies and policies for attracting and motivate the young people into the technical, technological and scientific research fields.

In this paper we present arguments that self-knowledge could be an important step in stimulating students' desire to embark on the professional career in electrical engineering. The study analyzes the answers given by students of the first year of study in Electrical Engineering and Computers program from Transilvania University of Brasov. The questionnaire is related to self-knowledge and if the students know the beauty and difficulty of this engineering domain. The results have been used in developing a new course outline on the professional communication.

**Keywords:** electrical engineering education, self-knowledge, professional communication, questionnaire.

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## **15. POLICIES TO ATTRACT YOUNG PEOPLE FOR RESEARCH CAREER: THE ITALIAN CASE**

**Marco RAGAZZI**

University of Trento, Trento, ITALY

#### **Abstract**

Young people is a term used by WHO to define people between 10 and 24 years of age. The present work focuses on the Italian approach adopted to attract people at the end of this range towards research careers. 24 years in Italy is the age mostly scheduled for completing a Master of Science (of course, real data on age of M.Sc. completion are different). Some differences of scheduling, generally limited to one year more or less, depend on specific sectors. The role of the topic chosen for the final thesis has been strategic for a long time. The Bologna Process, in the form adopted in Italy, compressed the contents of that activity, making necessary an integration of opportunities aimed to have young people in contact with research activities just in the period when he/she has to decide his/her career. The present work analyses these options showing advantages and criticalities.

**Keywords:** career, Italy, policy, science, young people.

## **16. POLICIES TO UNLEASH THE INNOVATION DRIVEN ECONOMY IN OUR COUNTRY AND ATTRACTING THE YOUTH TOWARD THIS SOCIO ECONOMIC PARADIGM**

**Alexandru BORCEA**

ARIES, Bucharest, ROMANIA

## **Abstract**

With the occasion of the general assembly of ARIES in 2004, the members of the association voted the industry's community support to implement the innovation driven economy in Romania. The subject was motivated by the signals coming from the labor market at that time. The first signal came from our members from Timisoara, but very soon similar signals came also from Bucharest and the other university centers of the country.

The subject is not new, but became acute in the last decades. All countries of the world, developed or less developed, try to face the challenge of the increasing speed of globalization, phenomenon which could be supported by an unprecedented speed up of the innovation driven economy. There have been registered special leaps, both in developed countries, but especially in regions which very recently were considered underdeveloped. The systematic loss of our competitiveness, but especially the massive migration of talents out of the country, determined us, not only to affirm our mission and our social responsibility, but also to act responsible, both for the industry community which we are representing, and for the national community to which we belong.

## **17. TALKING ABOUT SCIENCE IN THE EUROPEAN UNION. A LONGITUDINAL APPROACH OF THE EUROBAROMETER SURVEYS**

**Valentina PRICOPIE**

Institute of Sociology, Romanian Academy, Bucharest, ROMANIA

### **Abstract**

The emergence and evolution of the scientific vocabulary in Europe, as well as its social integration across Europe, constitutes an issue of high impact in the context of both sectoral and transversal European policies and recommendations. The analysis of the specific terms and expressions used in European opinion surveys (namely in the Special Eurobarometers) is a significant step in the study of the European citizens' interest and knowledge in science, given that the results of such surveys differ significantly among various reports. The methodological improvements in addressing the issue can cause social confusion and legitimate questions, such as: What is science?; How we define science?; What are the differences between science, technology, and innovation?; etc. Another doubt arises concerning the manner in which questions are asked in opinion polls, as well as the provided explanations. Our longitudinal study is thus focusing on the three basic concepts used in the Eurobarometer reports starting from 1973 i.e., *science, scientific research and technology*. The differences noticed are many times the reason for the reluctance of respondents who are every time faced with new concepts. This paper further interrogates the relation between science and society in the European Union, as seen through the eyes of its citizens in the last 45 years.

## **18. SURVEY OF THE ENVIRONMENT**

**Harry MINȚI**

Hebrew University of Jerusalem, ISRAEL

### **Abstract**

To the adaptive terrestrial optics added the deeper field that can be obtained with Hubble Telescope and the Gravitational Lens and a month ago was determined by spectroscopic measurements a star source from the galactic ball MACSJ1149.5 + 223.

By using ALMA (Atacama Large Millimetre / Sub-millimeter Array) was determined the existence of the oxygen line in the spectrum of the star, which determines an early phase of star formation. It is about 4% duration from 13.5 billion years, since Big Bang.

## **19. REIMAGING THE PAST. ROMANIAN STUDENTS REPRESENTATION OF COMMUNISM VIA BIC70 PROJECT**

**Valentina PRICOPIE, Cristina DÂMBOEANU**

Institute of Sociology, Romanian Academy, Bucharest, ROMANIA

## **Abstract**

This paper emphasizes the research and educational dimensions of Behind Iron Curtains – BIC 70 Project (<http://bic70project.eu>) with a focus on the Romanian team activities, namely on the one hand, advancements on social representations and memory of the Romanian communist past, and, on the other hand, the University of Bucharest students' involvement in preparing short movies about life under the communist regime. The transversal axis is a European one questioning shared social representations of the past in former communist countries. Subsequently, the educational aim was to rise young people's interest in using scientific investigation methods and their specific tools in social sciences and humanities, in order to reimagining traumatic events of their national past.

BIC 70 Project was co-financed by the Europe for Citizens Programme of the European Union and implemented in four countries between September 2015 and December 2016. The project was promoting the history of Europe 70 years after WWII, and fostering a sense of ownership for how the European Union develops. The project was focused on the contrast of the evolving dictatorship of the party state and its crimes against the democratic system of the EU nowadays in order to make the citizens aware over the opportunities for societal and intercultural engagement at EU level.

## **20. „THE TRIUMPH OF BAKELITE” – A MUSEUM TO ATTRACT YOUNG PEOPLE TOWARD SCIENCE**

**Elena HELEREA<sup>1</sup>, Maria Elvira CALLAPEZ<sup>2</sup>**

<sup>1</sup>Transilvania University of Brasov, Brasov, ROMANIA

<sup>2</sup>University of Lisbon, Lisbon, PORTUGAL

### **Abstract**

In 2016, a research project started for the impact analyses of plastics on the human society, combining the methodological approaches of the history of science and technology with the education percepts.

Coordinated by University of Lisbon, the project “The Triumph of Bakelite” involves many research groups from Portugal and cooperation groups from University of Maastricht, Transilvania University of Brasov, and Helmut-Schmidt University of Hamburg.

The project sustains many ways to attract young people to the future scientific and technical professions. The memory and remembrance on the technology and applications of plastics are embodied by an exhibition on the history of plastic materials, and by setting up a museum within a plastics manufacturing plant in Leiria town, with sections also focuses on the many applications of plastics in modern life, and on the polymer waste recycling solutions that protects the environment and reduces the consumption of natural raw materials.

**Keywords:** plastics, history, impact, museum, education

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## **21. EDUCATIONAL PROJECTS TO ATTRACT STUDENTS INTO ENGINEERING**

**Aurel TUDORACHE**

Technical Museum UPB, Bucharest, ROMANIA

One of the problems of the current education in Romania is abstraction. Most of the laboratories and workshops in schools have disappeared, and where they still exist they are used very little. Students no longer practice in factories, the computer is often used inappropriately. All of this leads to inadequate training of students, to a lack of competitiveness, to low interest in applied research, negatively impacting the economy's demand for skilled labor.

It is necessary to find ways to remedy or at least to ameliorate the shortcomings in the training of future specialists. The presentation of lessons accompanied by demonstrations and experiments and the presentation of technical history themes familiarizes students with the evolution of technological progress, with the history of scientific discoveries and helps them to better perceive reality.

The Technical Museum "Prof. Ing. Dimitrie Leonida" presents an evolution of the steam engines by using functional models, as well as steam engines and steam engines parts that were used in Romania. These are unique in Romania and they represent the evidence of technological progress in the Romanian economy.

## **22. DEVELOPMENT OF ABILITIES IN THE FIELD OF INNOVATION AND INVENTIONS THROUGH CREATIVE EDUCATION**

**L. Dan MILICI<sup>1</sup>, Victor SUTAC<sup>2</sup>, Anca GRECULEAC<sup>3</sup>**

<sup>1</sup>Stefan cel Mare University of Suceava, ROMANIA

<sup>2</sup>Cygnus Scientific Society – UNESCO Center, ROMANIA

<sup>3</sup>Petru Rares National Colledge, Suceava, ROMANIA

<sup>1,2</sup>MILSET ROMANIA

### **Abstract**

Education has many aspects: learning how to live in a balanced and healthy way, in harmony with nature and society, creating a proper culture, a correct way of thinking, and sets of principles that generate identity for a person, but also the formation of skills and abilities, in accordance with personal desires and affinities, to ensure the individual's economic independence and to transform it into a unique and necessary link in its community. All learning is done in a cultural environment, and culture can be seen as a process of perpetuation and cognitive innovation. As a result, even when learning informally, this is assisted.

From this perspective, many educators can be seen as agents of the social environment that guide and accelerate premeditatedly the learning, in the sense of perpetuation and cultural innovation from generation to generation. To a large extent, educators should be seen, at the scale of history, as conservative elements who are being denied by another social category – researchers. Researchers are the ones who learn directly from the tension born between culture and nature and that generates elements of culture and civilization, being constantly under the influence of curiosity and making continuously analyses and cognitive deductions.

In the current context, driven to a sustainable development, innovation plays an essential role in the formation of new generations. But today's school is based on critical thinking, exactly the element which, by unilateral development, inhibits creativity. The school must naturally combine critical thinking and creative thinking and must find the balance between rational creativity and global ethics to give a chance to humanity at the planetary level.

**Keywords:** innovation, inventiveness, creative thinking, critical thinking, engineering education

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## 23. THE ONGOING YOUNG PEOPLE MOVING OUT OF THE TAIWAN ECONOMY: PROBLEM ANALYSIS AND SOLUTION CAPABILITY

**Chen MIN HSU**

CEO, Center for Mobile Banking - CTCB Business School, Tainan, TAIWAN

### Abstract

The ongoing young labor movement to other countries becomes an important issue recently. It is due to two factors. Firstly, the average wage for young workers is stationary for the last decade. Secondly, the economic structure adjustment to the digital and internet economy is slow in the same period, in comparison to the US and China. These cause the new generation workers to find new opportunities in the US and China. Since 1990, the ICT (Information and Communication Technology) globalization had caused the Taiwan economy to enjoy fast growth and high valued supply chains, according to Baldwin (2016) "The Great Convergence", for example the Apple outsourcing to Taiwan firms to work out iPhone and iPad. However, the slow internet technology innovation and the trade protection conflicts between the US and China have pushed some Taiwan young people to choose to study in these two countries and stay to work there. The policy to avert from this trend is not to restrict the labor mobility, as pointed by Brynjolfsson and McAfee (2014) "The Second Machine Age", and what Granham, Hjorth and Lehdonvirta (2017) mentioned as the prevailing Gig economy in Shanghai and Beijing. What the government could do is to induce more high technology multinational corporations to invest in Taiwan and give more incentives to domestic firms to invest in the new digital and internet economy related products such as AI (artificial intelligence), Big data analysis, IOT (internet of things) etc.

## 24. GEOLOCATION AND SOCIAL MEDIA FOR ENHANCED RECRUITMENT CAMPAIGNS FOR YOUNG PEOPLE

**George SUCIU<sup>1</sup>, Adrian PASAT<sup>1</sup>, Carmen NADRAG<sup>1</sup>, Cristina BALACEANU<sup>1</sup>**

<sup>1</sup>Beia Consult International, R&D Department, Bucharest, ROMANIA

### Abstract

Recruitment is one of the main areas that embraced social environments as a universal employment tool, and 92% of recruiters have confirmed its use as part of their employment process. Typical options, such as search engines, are quite limited in providing a fair deal, and therefore the aim of the paper is to show an innovative solution tailored to the Romanian HR sector advancing several Digital Intelligence Interaction (DII) tools developed using both cloud service frameworks and Natural Language Processing (NLP). With the advances in artificial intelligence, data analysis solutions and integrated algorithms in automated learning processes, the our solution provides insight into ubiquitous interactions within online social platforms, processing a fantastic amount of communication that gives information about preferences, interests, and intentions.

**Keywords:** recruitment; search engines; geolocation; sentiment analysis; text mining

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## 25. MEMBERSHIP FUNCTIONS COMPUTATION IN REAL HILBERT SPACES

**Mircea SULARIA**

University Politehnica of Bucharest, ROMANIA

### Abstract

Let  $X$  be a real Hilbert space,  $I$  be a nonempty set and  $f: X \rightarrow \mathbb{R}^I$  be a function from  $X$  into the power set  $\mathbb{R}^I$ , where  $\mathbb{R}$  is the set of all affinely extended real numbers. The following system  $M = (X, I, f)$  is called a fuzzy environment model for multi-attribute decision making, with the set of all alternatives  $X$ , the set of all attributes  $I$  and the objective function  $f: X \rightarrow \mathbb{R}^I$ , where  $\forall x \in X, f(x): I \rightarrow \mathbb{R}$  is a function such that  $\forall i \in I, f(x)(i) \in \mathbb{R}$  is the utility value of the alternative  $x$  with respect to the attribute  $i$ . A Bellman-Zadeh membership function corresponding to a fuzzy environment model  $M = (X, I, f)$  is a function  $\mu_M: X \rightarrow \mathbb{R}$  such that  $\forall x \in X, \mu_M(x) = \inf\{f(x)(i) : i \in I\}$ . In this paper we introduce the notion of Pareto membership function corresponding to a fuzzy environment model. Then a mathematical method for Pareto membership function computation will be presented.

**Keywords:** affinely extended real numbers, Hilbert space, multi-attribute optimization problem, Pareto optimal point, fuzzy set.

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## 26. INDUSTRY 4.0 AND YOUTH EMPLOYABILITY

**Hakan ERCAN**

TURKEY

### Abstract

The current decade has introduced the buzzword Industry 4.0 as the name of the most recent industrial transformation in the world. The first of these modern era transformations started with the invention of the steam engine, and its incorporation into manufacturing production at the end of the 18<sup>th</sup> century. This is now dubbed Industry 1.0. As with all such major transitions spanning the employment-industry nexus, profound changes regarding the social order are to be expected. Industry 4.0 term embraces concepts like digitalization and Internet of things. How is it different from automation and omnipresent computer programming that consumers encounter many times during their daily routine? (Think of an ATM transaction for cash withdrawal, a credit card purchase at a store, or online shopping.) Here is the key difference: Any personal gadget, property, or production-transaction related tools (including cash registers or computers) that one uses in her occupation will be interconnected. Current digital systems are computer based (“electronic brain” chips in cars or washing machines are also computers, as well as cell phones) and require communication protocols like Bluetooth, cable or Wi-Fi Internet to access digitally stored data. Usually, these

are digitized islands that typically require a human to authorize and initiate a connection and subsequent action (e.g. of querying the inventory for an automated order). In the Industry 4.0 era, sales software and shop floor AI's will communicate without needing human participation AND initiate production within authorized levels! Human supervision will be at a higher level of system check, design and maintenance algorithms. Just like the first industrial revolution with the steam engine, or the second one with the electricity-based assembly line production, or the third industrial revolution of electronics based automation, there will be fundamental modifications in the structure of employment and production. Most importantly, low-level service jobs will start to disappear. Note that, during the last quarter of the 20<sup>th</sup> century, automation delegated repetitive manufacturing tasks to robots in industrial production. Most new jobs were created in the low wage personal services industry. Top paying jobs were created in the high skilled segment across all industries. Top and bottom wages diverged. Now, with the pending threat of accelerating job losses at the lower level administrative and service occupations, industrial world and the emerging markets will face a colossal task: That of creating employment for the displaced and the youth. Many countries are already struggling with the problems of long-term unemployment and youth unemployment. The change will be hard-hitting. It is now time to study the lessons of the past transformations.

## **27. DO YOU SPEAK SCIENCE? HOW RESEARCHERS AND PUPILS CAN LEARN FROM EACH OTHER ABOUT SCIENCE**

**Ionuț TOPALĂ<sup>1</sup>, Cătălin AGHEORGHISEI<sup>1</sup>, Mădălina COCEA<sup>2</sup>**

<sup>1</sup>Iasi Plasma Advanced Research Center (IPARC), Alexandru Ioan Cuza University of Iasi, ROMANIA

<sup>2</sup>Department for Student Services and Alumni Affairs (DSSA), Alexandru Ioan Cuza University of Iasi, ROMANIA

### **Abstract**

Researchers' Night in Romania. Do you speak science? (H2020-MSCA-NIGHT-2014 Project ID: 633311, RoTalkScience), a EU funded project through Horizon 2020, is one of the few opportunities in Romania to present science in an accessible, fun and interactive manner to children. In 2014 and 2015 we organized activities around the concept #doyouspeakscience, creating a two-way conversation: with the general public, about research and science; with researchers, about the importance of the communication in science. Our objectives were to make middle-schoolers and high-schooler to fall back in love with science, but also to make aware university researchers of the need to adjust, fun-ify and translate their otherwise technical and cliquish scientific language. 10 of the most prestigious science institutions in Romania have joined forces to organize the event in 6 most important cities in the country: Bucuresti, Cluj-Napoca, Craiova, Iasi, Sibiu and Timisoara.

In the two years of the event, over 50.000 people, out of which 75% were high schoolers or middle schoolers, took part in the activities and had face-to-face interaction with researchers. The results were encouraging: around 80% of participants said that they improved their opinion on researchers and science.

Our efforts continued during the 2016 and 2017, with an annual event only in Iasi, called "Noaptea de Stiinta", supported by local sponsors and volunteers. Currently, we are preparing the activities for 2018 and 2019, under the EU project Handle with Science (HSciRO).

## **28. YOUNG PEOPLE ATTRACTING FOR THE SCIENTIFIC RESEARCH ACTIVITY IN THE MODERN BRANCHES OF TECHNOLOGY**

**M. GHEORGHE**

NANOM MEMS SRL, Râșnov, ROMANIA

### **Abstract**

Starting from the fact that the number of problems faced by contemporary human society is greater than the number of solutions provided for these issues, the importance of scientific research activity and the importance of this activity is increasing continuously.

The formation of a scientific researcher involves, among other things, the existence of models and the facilitation of young people's access to laboratories (in schools, universities, research institutes, companies, etc.). Through this access, young people can acquire information and useful skills for the profession of researcher and also this access offers a good opportunity to try successful or unsuccessful experiments under strict supervision (the error is present in a multitude of human activities).

Some personal examples will be given on the training of the author of this exposition as a scientific researcher, examples of NANOM MEMS activity, as well as the interaction of NANOM with young people in the early stages of training as a scientific researcher.

## **29. 'CLINICAL' PERSONALITY TRAITS IN HIGHLY CREATIVE POTENTIAL RESEARCHERS AND ARTISTS**

**Marius M. STANCIU**

University of Bucharest, ROMANIA

### **Abstract**

The link between psychopathology and creativity represents probably one of the most controversial areas of study within contemporary psychology. Going beyond the anecdotes that showcase the bizarre behaviours of illustrious figures such as Nikola Tesla, Ernest Hemingway or Sylvia Plath, the literature seems to suggest that the way madness and creativity relate to each other is still insufficiently understood. Almost half of century of research has pointed out that developing a comprehensive model of the creative genius require us to go beyond classical personality factors (e.g. Big Five; Costa & McCrae, 1992) into the realm of 'clinical' personality traits (Crow, 2008; Eysenck, 1995; Feist, 2010; Nettle, 2001), such as dimensional autism (Baron-Cohen *et al.*, 2003) and schizotypy (Claridge, 1997). Starting from the data collected from a national sample composed of highly creative young people, this paper wishes to explore the epistemic merit of such perspectives, while evaluating the 'double vulnerability' model proposed in the literature (e.g. Carson, 2011). Some recommendations on how to handle creative but vulnerable individuals are also derived.

**Key words:** creativity, performance, schizotypy, personality, autism.

## **30. COMENTARIES ABOUT THE BUILDING OF THE SCIENTIFIC RESEARCH CENTRE ON THE INITIATION OF THE LYCEUM STUDENTS**

**Mircea IGNAT**

National Institute for Research and Development in Electrical Engineering ICPE – CA, Bucharest, ROMANIA

### **Abstract**

The paper is based on the author experience to the setting up of the Alexandru Proca Centre of initiation to the scientific research of the lyceum students (which was organised on the Research National Institute of Electrical Engineering ICPE-CA).

There are presented the main stages:

- The methods and the procedures of the members selection;
- The initiation course;
- The choice of the research project and team establish;
- The competition calendar.

## **31. EVOLUTION OF THE DEVELOPMENT OF SCIENCE IN THE REPUBLIC OF MOLDOVA AND THE CURRENT STATE OF SUPPORT OF YOUNG PEOPLE IN THE RESEARCH ACTIVITY**

**Ghenadie CIOBANU**

INCSMPS, Bucharest, ROMANIA

In this article we intend to approach the stages of scientific research development in the Republic of Moldova by branches of activity, highlighting the main scientific schools that have developed especially in the exact sciences and natural sciences. We plan to show the strategic priorities for the development of science and innovation in Moldova. An important aspect of the article is given to the issue of supporting research in the field of research and innovation, the promotion and integration of young researchers in science and innovation, the perspectives of involving young researchers in national and international scientific projects, and the difficulties faced by them in the field science and innovation.

**Keywords:** development of science in the Republic of Moldova, science and innovation

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