



**STAGES PER STUDENTI DI SCUOLA SECONDARIA
DI SECONDO GRADO**
www.inf.infn.it/edu/stagelnf/



STAGES INVERNALI 2010
1 febbraio - 19 maggio

ZAFAROLLAH KALANTARI

Isfahan University, Iran



Q: Please send us a short presentation of you including, if possible, a picture.

I was born in Ahvaz, a southern city of Iran, in 1965. I passed the education before university in Ahvaz and then I got accepted in physics in Shiraz University (1984) as an Undergraduate student and graduated with top score in 1989. I got started M.S. in 1989 at the same university. Then I resume Ph.D. in 1992 in shiraz university and graduated in 1996. I started my academic position in Isfahan university of Technology in 1996 (Isfahan is a famous city in the center of Iran). Now I am associate professor of physics there. I am teaching some graduate and undergraduate courses in physics and research with my M.S. and Ph.D. students. I am also a member of the physics society of Iran and editorial board of Iranian Journal of Physics Research. I am married and have two children, a daughter of 7 years old and a son of 13.

Q: What are you working at now and what are your ambitions or expectations?

I am working on Exotic atoms and nuclei in general and kaonic atoms and kaonic nuclei especially. When a heavy negative particle enters a target it many replace an atomic electron and exotic atom is formed. I am working with my Ph.D. students on simulation of cascade processes of the exotic atoms and determining the x-ray yields during the cascade of atoms. The study of cascade processes is very important in the investigation of exotic atoms. In particular, knowing the main characteristics of cascade in kaonic and pionic atoms allow one to perform a detailed analysis of the experiments to investigate the strong interaction of the kaon or pion with the nucleon and nucleus. We also like to investigate the bound states of kp and kd systems to increase our knowledge about strong interaction of kaons with nucleon and nucleus.

Q: How and for what reason was your interest for physics born? Which characters have influenced this choice? What is the most beautiful memory of your life as a student?

I was thinking about some physical phenomenon most of the time when I was in high school. For example, I was curious about the reasons of motion and the laws of optic and nature were fascinating for me. Many of my scientific questions were solved in physics courses and more questions were produced in my mind that were very interesting for me. Mathematics and physics teachers of mine had important role in growing my knowledge and interest in these subjects. There fore I select physics as the first choice in entrance exam of university. Collaboration with the Bironi observatory group of Shiraz university and learning astronomy in there are my best memories during undergraduate study. Learning how to take astronomical photography and work with telescope were enjoyable. My friends and I could observe the Halley's comet by telescope in Bironi observatory. I don't know if I have another chance to see Halley's comet again, because its period is 76 years. I have unforgettable memories with my friends there.

Q: Which difficulties did you have to deal with in your career? What has given you the strength to carry on? Which was the most significant event of your career?

When I was a Ph.D. student, the Ph.D. programs in physics had been started recently in the Iranian universities. On the other hand the internet was not powerful and getting the up to date papers was very difficult. So, we had many problems to research. I got married in the third year of my Ph.D though my financial problems. But I

was so interested in physics and research works and I believed my abilities and the help of God. Finally I overcame the hardships of that situation successfully. Now, the Ph.D. programs of physics is at the beginning in the third decade in Iranian universities and when I see our situation right now the development is undeniable. I am supervisor of three Ph.D. students right now that the first one was graduated with excellent degree a few month ago.

Furthermore, our international community and collaborations have been growth. As after my beginning of the academic work in Isfahan University of Technology I could join to prof. Catalina Curceanu and prof. C. Guaraldo in DEAR and SIDDHARTA group in LNF in Italy. They introduced their experiments on exotic atoms for us. Then we developed our calculations on muonic atoms and muon catalyzed fusion to simulate the cascade processes of kaonic atoms. Our calculations can be used to analyze their experiment and they are important to determine the optimum conditions for such experiments.

Now we have developed our collaborations with the people who are working on kaonic atoms and kaonic nuclei.

Q: Which do you believe will be the next discovery in physics, and how this might contribute in changing our lives?

Forthcoming results of the LHC experiments, for example the test of existing Higgs particle.

Q: In your opinion, what has been the biggest discovery in physics and who has been your "reference-scientist"?

It is a kind of hard question because I think all of the discoveries of the fundamental laws in physics are important for example the works of Newton have undeniable influence in physics. However, I think relativity by Einstein and Quantum mechanics by Bohr, Shrodinger and Heisenberg with some other people in that time produced a big revolution in physics.

Q: What characterizes research workplace and how is scientific collaboration organized?

A perfect workplace should be a favourable place with: 1- well equipments, 2- an appropriate financial investment, 3- an expert chairman who should be an experienced scientist with proper ability of management, 4- expert secretaries, 5- expert personnel, 6- expert scientists who have enough knowledge and experiences for the purposes of the research centre, 7- well organized meetings and conferences about the research fields, 8- international communications and collaborations.

At first the project should be accepted in an expert scientific committee then it should be divided as subprojects in three groups: Theoretical, numerical and experimental.

Q: Considering the crisis of inscriptions in scientific faculties, which do you retain are the reasons of the gap between young people and scientific studies and what may the world of research do in order to change this trend?

I think teachers should show the beauties and importance of basic sciences for students and advice the talented young people to select the basic sciences for their university studies. Financial supports of the students in these fields may solve this problem.

Q: How can a scientist be defined and how do talent, intuition and study influence his profession?

A scientist is a talented person who studies and researches in a particular field in science. Then he/she can discover some results in his/her field and present them in scientific societies. Talent is necessary but not enough to reach this purpose. Studying, working and working with a small intuition are needed.

Q: How do you spend your free time?

I do exercise, listen to music, watch T.V., read books of history and travel with my family.

Q: In this period of economic crisis, how do you see the future of research and what do you think about the employment of nuclear energy for energetic aims?

I think it is a temporary situation.

Any way more and more research is needed (knowledge is power).

About nuclear energy, I think it is one of the best ways to solve the crisis of energy in the world. Particularly, if the Fusion reactors is made an evolution of energy production will be done.