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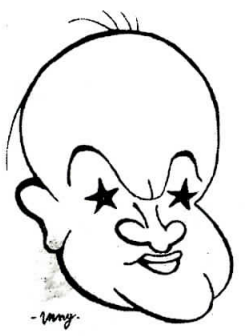
'Big Bang theory says the universe came into existence some 13-14 billion years ago. We don't agree'

Jayant Narlikar, founder-director and now emeritus professor at the Inter-University Centre for Astronomy and Astrophysics in Pune, is internationally known for his work in cosmology, in championing models alternative to the popularly believed Big Bang model. This Idea Exchange at *Loksatta*, Pune, was moderated by Executive Editor Girish Kuber

IDEA eXCHANGE



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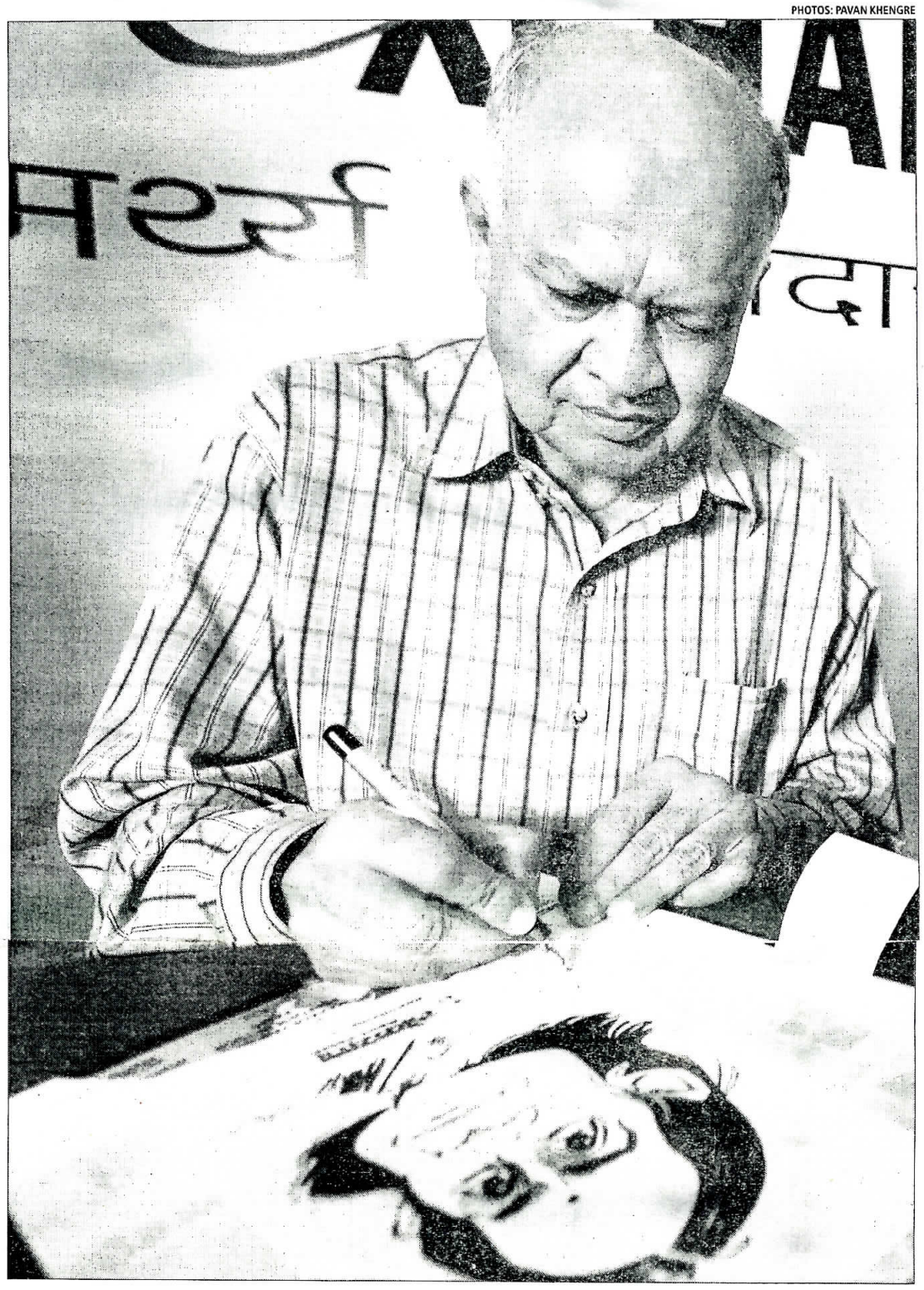

ABHIJIT GHORPADE: Your research says the universe existed much before Big Bang. Can you explain.
According to the Big Bang theory, the universe came into existence some 13-14 billion years ago. We don't agree. Four of us have been working on this research, including my colleague at Inter-University Centre for Astronomy and Astrophysics (IUCAA) Vijay Mohan, an Australian professor and one scientist from the European Southern Observatory (ESO). We are in search of stars whose lives go back more than 20 billion years. On the edge of our galaxy, there is a smaller galaxy called Large Magellanic Cloud. Magellanic was a traveller who noticed the Magellanic Cloud from the southern hemisphere. In this big cloud, we noticed stars which we think could be 20 billion years old. But this has not been proven completely. We had plugged the holes in the theory but when it was sent for publication, one referee raised a point. Therefore, we are still researching it.

PRASHANT DIXIT: Is the universe infinite or does it keep taking birth, does it keep changing?
We call it a quasi steady state. Imagine this: the universe keeps spreading and at a particular speed. There is no change in it and therefore, it is called a steady state. If we consider market rates for a year, we notice that there is an up and down in the rates of vegetables. But if we consider the rates over two years and we notice that the rates have gone up, it means there is a "long term trend". Likewise, there is a "long term trend" of the universe that is called expansion. There is expansion and contraction taking place. It is believed that this universe was never created, it is infinite and new developments are constantly taking place. During this, some stars are born. After sometime, they are destroyed. This is what is the universe.

GIRISH KUBER: Are there other universes like this one?
No, not in our opinion. Some people believe there are many universes. But I believe there is only one. Beyond that, it is a completely "imaginary universe". There is no scientific proof available for the existence of another universe.

VINAYAK PARAB: Your other research relates to the origin of life. Please throw some light on it.
One of the theories is that there is life on the universe and micro organisms keep falling on the Earth. One of the ways microbes come to the Earth is through a comet. It is believed that the microbes come to the Earth's atmosphere by clutching onto the tail of the comet. And through gravity, they settle on the Earth. How do you search for them? We decided to send a "payload" which had several cylinders and was attached to balloons. The cylinders were to be disinfected and sealed. They were to be opened at a particular height and filled with the surrounding air. We could go up to a height of 41 km and collect samples at different heights. If the balloon had gone much higher, it would have been difficult to collect air samples as the air is not thick at a greater height and the balloon would not have remained intact. We did an experiment in 2001 and another in 2005. In both the experiments, we found bacteria. In 2005, we found some bacteria which are not known on Earth. After doing this, the question that arises is, how did living matter reach this level? A volcanic eruption sends things up to 26-27 km. We have not found a way in which to send up things up 41 km. If it has to be positively proven that life is from outer space, then it needs further analysis. We have sent a proposal to ISRO for a balloon flight to carry out such analysis. I hope that will happen soon.

SHRIKANT KULKARNI: After the creation of the universe, several changes have taken place. Is there a superpower or an invisible power controlling it?
I have no answer for this. If the answer is God, then some scientists agree and others don't. Science is applicable to the world. The question is, where has science come from? We have no answer to this. Can science answer your question? We can't say.

MUKUND SANGORAM: You have written on science in Marathi and made it simple to understand. You are from Kolhapur and you studied abroad. Where do you get the inspiration for writing science in Marathi?
I started writing science stories after an incident. At a discussion, a speaker was delivering a boring address. I feared I would fall asleep. In order not to fall asleep, I started writing a science story. That's how it started.

PRASHANT DIXIT: What is the difference between a scientist's imagination and that of artists and filmmakers?
I don't keep them in a different compartments. The imagination is based on a man's experience. My writings reflect my experiences. One of my science pieces started with a cricket match.

RAJENDRA YEVLEKAR: Doomsday 2012 is being discussed. People also talk about a 'death star' approaching us.
I think we should not accord too much of importance to this. We should find out if there is science behind it. Some scientists say a comet will hit us in the next century. It seems the comet and Earth are going to clash. But one cannot say anything for certain. Along with the gravitational force, other forces also have an effect on the comet. So if there is a little change, the clash could be avoided. We should avoid drawing conclusions. The instances you are citing would frighten people.

PRASHANT DIXIT: What is your take on superstition?
At an international conference in Brazil, I narrated an anecdote. A man is moving around wearing a coat. A competition breaks out between the sun and the air over who is stronger and who can get the man to remove his coat. When the air blew fierce, the man clutched onto his coat. When the sun beat down mercilessly, the man removed his coat. We encounter superstition around us and take an aggressive position, people then embrace superstition even more. That's why I don't take an aggressive stand, I place facts before people and leave it to their judgment.



Jayant Narlikar with wife Mangala Rajwade

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PRASHANT DIXIT: There is so much apathy about science and technology that it is said a UPA minister who was handed the Science and Technology portfolio said it was not important.
It reveals your priorities. It is regrettable that there are not many politicians who are in favour of science and technology. If we spread science through mass education, then science and technology will take deep roots.

ABHIJIT BELHEKAR: The human genome project is slated to bring in a great revolution. At what stage is the project?
Imagine you have bought a toy and it breaks down after a few days. It requires a manual for repairs. After reading the manual, experts will tell you what has gone wrong. This will become applicable to humans or animals through the project. A complete manual of human beings will be made. That means when you visit a chemist, he is going to have your full details in a manual. The chemist will then understand what is wrong with you.

PRASHANT DIXIT: You played a major role in establishing IUCAA. What is it working on now?
It is said that an organisation declines after the founder retires but this did not happen at IUCAA after I retired in 2003. The standard of the institute has remained the same. Many new topics have been taken up for research. IUCAA is among the organisations participating in the 11-metre radius telescope in South Africa. IUCAA has been invited to be part of it since the expenses of the mega telescope cannot be managed by one organisation. It's a privilege to get such an invitation.

PRASHANT DIXIT: Tell us about your fondness for Sanskrit.
I had to learn the language at home. I took advantage of my mother being a Sanskrit scholar. I have retained my interest. I have written imaginary stories on my grandchildren in Sanskrit. I write the stories as in *Panchatantra*. They have been published. The language is not outdated.

GIRISH KUBER: You are a very responsible human being. You carry a small bag with you every time you step out and collect the plastic waste you come across. Do you think our values are changing with time?
In this era, importance is given to how you present yourself. I don't accept that a person is good if he is well-dressed and carries an expensive briefcase with a cellphone.

PRASHANT DIXIT: Are talented young people, the best brains, taking up research or are they following Wall Street?
There has been a positive change after the Indian Institute of Science Education, Pune, came into existence. It's good that they are getting talented youths. They will definitely follow a career in science.

RAJENDRA YEOLEKAR: You have three daughters. What is your opinion on female foeticide?
I had written a science fiction story on this issue in 1977-78. At that time the issue had not become this serious. I had dwelt on what could be done. There is a need to educate society. There can be strict laws but people have to understand the impact of foeticide on society.

MUKUND SANGORAM: You returned to India in 1972. How do you rate the scientific temper in the West and in India, then and now?
Science in India has advanced greatly since then. Even in my subject, astronomy, there has been tremendous advancement. But even then, institutes such as the Tata Institute of Fundamental Research had a working environment similar to those in Western nations. So I did not feel a great deal of difference.

GIRISH KUBER: There has been a tradition of mathematics in your family—from your grandfather to you. What about the younger generation?
We never expected our daughters to take up a career in mathematics or science. They are into science research as per their own interest. We never pressured them. This gives us more satisfaction.

Transcribed by Manoj More