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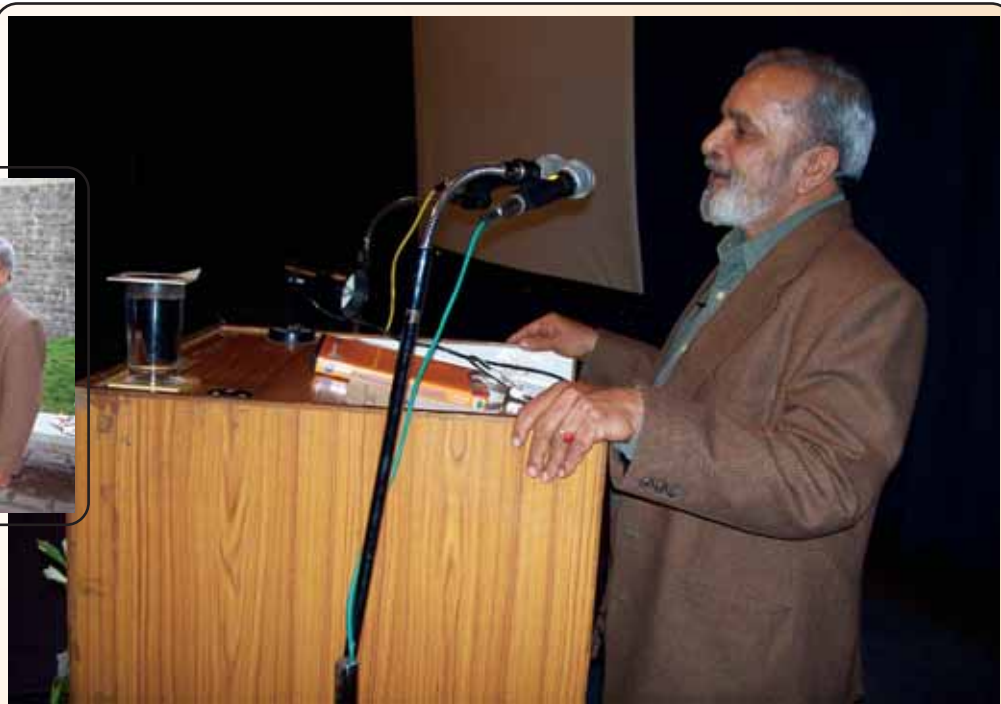
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18th IUCAA Foundation Day Lecture



Professor U. R. Ananthamurthy at an informal gathering



Professor U. R. Ananthamurthy delivering the eighteenth Foundation Day Lecture at IUCAA

Professor U.R. Ananthamurthy delivered the 18th IUCAA Foundation Day Lecture, in which he expounded on his thesis of many Indias with many centres, with a synthetic civilizational whole signifying 'unity in diversity' in a very enlightened and meaningful manner. Each Indian bhasha (language), though region bound, is still global as it mirrors the universe in its own perception and hence acts as a centre. In this paradigm, each point in universe could be a centre and there need be no conflict between different centres. Ananthamurthy emphasized that denying this basic principle would lead to a terribly dangerous situation of a uniquely preferred location, race, creed, caste, colour, language, odour, etc., which is profoundly untenable. Unity and diversity are complementing duals, and hence the pertinent question is to strike a right and wise balance between the two.

Congratulations to ...

Jayant Narlikar, on being conferred with the **H.K. Firodia 2006 Award** by H.K. Firodia Memorial Foundation.

T. Padmanabhan, on being elected **Vice-President of Commission 47 on Cosmology**, of the International Astronomical Union for the period 2006-2009.

R. Srianand, on being conferred with the **Professor Vainu Bappu Gold Medal Award (2004)** by the Astronomical Society of India.

Tarun Souradeep, on being conferred with the **SCOPUS Young Scientist Award (2006) in Physics** by Elsevier India, New Delhi, *and* on being conferred with **Swarna Jayanti Fellowship** awarded by the Department of Science and Technology, Government of India.

Discussion meeting on Nonlinear Phenomena and Techniques

A discussion meeting on Nonlinear Phenomena and Techniques was held at IUCAA, during Nov 2 - 4 2006. The broad motivation for this meeting was to discuss the recent trends of applying non-linear techniques to different kinds of systems and data, especially those related to astrophysical sources. The meeting, coordinated by Ranjeev Misra (IUCAA) and G. Ambika (IISER, Pune), was coincident with the long term visit of Y. Tanaka (Ibaraki University, Mito, Japan) to IUCAA. The lectures and discussions were spread over three sessions, viz., Recent Techniques in Nonlinear Physics, Nonlinear Phenomena in Astrophysics, and Collective Behaviour in Nonlinear Systems. The participants included, M. Lakshmanan (CNLD, Bharathidasan University, Tiruchirapalli), Y. Tanaka (Ibaraki University, Mito, Japan), R. E. Amritkar (PRL, Ahmedabad), G. Rangarajan (IISc, Bangalore), A. D. Gangal (University of Pune) M. K. Das (IIC, Delhi), G. Ambika (IISER, Pune), R. Misra (IUCAA, Pune), Arnab Kumar Ray (IUCAA, Pune), K. P. Harikrishnan (The Cochin College, Cochin) P. M. Gade (Centre for Modeling and Simulation, University of Pune), Renja Sarkar (University of Pune), Rajesh S. (CCMB, Hyderabad), K. Ambika (Maharajas College, Cochin), B. Dey (University of Pune) and Hemant Bhate (University of Pune). Apart from lectures, there were active discussions, which were expected to lead to inter-disciplinary research and interactions in future.

Welcome to ...

Ratna Koley, who has joined as a Post-doctoral Fellow. Her areas of research are Physics of extra dimensions: Braneworld models, effective field theory, braneworld gravity, and cosmology.

Biswajit Pandey, who has also joined as a Post-doctoral Fellow. His areas of research are Topological and morphological analysis of large scale structure, and the effect of redshift space distortions in galaxy redshift surveys.

Prasant Kumar Samantray, who has joined as a Research Scholar.

IUCAA Alumni Association

IUCAA is happy to form the IUCAA Alumni Association of all former as well as the present workers, research scholars, post-docs, and visiting associates. There is no fee to be paid. If you are one among them, please send your details such as, full name, present position, contact address, e-mail address, phone/mobile number, your position in IUCAA, the period in which you are/were associated with IUCAA, etc. to Manjiri Mahabal, IUCAA, Post Bag 4, Ganeshkhind, Pune 411 007, India (e-mail : mam@iucaa.ernet.in).

Workshop on Advanced Topics in Data Analysis in Cosmology and Gravitational Wave Astronomy

The Workshop on Advanced Topics in Data Analysis in Cosmology and Gravitational Wave Astronomy was held at the IUCAA Reference Centre at Delhi University during October 4 – 14, 2006. The aim was to teach the interested participants the techniques of modern data analysis in Astrophysics. Most of the talks were on data analysis applied to Cosmic Microwave Background Radiation and to Gravitational Wave Astronomy. There were also talks related to dark energy, simulations of large-scale structures, virtual observatory, high-energy physics and error analysis of the observations using the medieval observatory, Jantar Mantar at Delhi. It was attended by more than 50 participants. The audience included B.Sc., M.Sc. and Ph. D. students and also a number of faculty members from colleges and the universities in Delhi. Speakers included Tarun Souradeep (IUCAA), Sanjeev Dhurandhar (IUCAA), Rita Sinha (IUCAA), Jasjeet S. Bagla (HRI), Harvinder K. Jassal (HRI), Satyaki Bhattacharya (Delhi University), and N. Ratnashree (Nehru Planetarium, Delhi). The session were very interactive with lots of discussions.

The program also included a lecture tour of Jantar Mantar, which is an observatory built by Raja Jai Singh. Here, under the supervision of N. Rathnashree, some of the participants had a hands on session making measurements and doing calculations .

More details can be found on the web page of IRC, Delhi University: <http://web.du.ac.in/~irc/>. Some of the lectures can be found at: http://web.du.ac.in/~irc/Academic/workshop/data_analysis/Oct_workshop.html. This workshop was coordinated by T.R. Seshadri (Delhi University) and Tarun Souradeep (IUCAA).



**Participants and lecturers of the Workshop on Advanced Topics in Data Analysis in Cosmology
and Gravitational Wave Astronomy**

Refresher Course in Astronomy and Astrophysics

IUCAA will conduct a Refresher Course in Astronomy and Astrophysics for teachers in universities and colleges during May 14 - June 15, 2007. The topics will include observational and theoretical aspects of astronomy, and state-of-the-art methods of data analysis. There will be emphasis on the use of computers for accessing and analysing archival data, and a detailed introduction to the capabilities and use of the new IUCAA 2m telescope.

The number of participants for the course will be limited to 20. Interested persons should apply on plain paper, giving their curriculum vitae, and their experience of teaching and research in astronomy over the last five years. Applications should be forwarded through the Head of the Department /Institute, so as to reach **The Coordinator, Core Programmes, IUCAA, Post Bag 4, Ganeshkhind, Pune - 411 007** (e-mail: vch@iucaa.ernet.in) by February 25, 2007. The candidates will be informed of their selection for the course by March 10, 2007.

Vacation Students' Programme

IUCAA invites applications for the seventeenth Vacation Students' Programme (VSP). Students selected under the VSP will spend seven weeks at IUCAA to work on specific research projects under the supervision of the IUCAA faculty. The programme will conclude with seminar presentations of the projects by the participants, a written test, and an interview. Those who perform well will be selected to join IUCAA as research scholars to do Ph.D. after the completion of their degree and other requirements.

Students who will enter the final year of the M.Sc. (physics/applied mathematics/astronomy/electronics)/ B.Tech./B.E. courses in the academic year 2007- 2008 are eligible to apply. Exceptionally bright students with academically proven track record of third year B.Sc. (physics/electronics, or second year B.Tech./B.E. or students of integrated M.Sc.-Ph.D. courses (during the first two years) may also apply.

Applications, in plain paper, giving the academic record of the applicant as well as two letters of recommendations from teachers, mailed directly, should reach **The Coordinator, Core Programmes, IUCAA, Post Bag 4, Ganeshkhind, Pune 411 007, (email: vch@iucaa.ernet.in)** by March 11, 2007. The selected candidates will be informed by March 20, 2007 for the programme to be held during May 14 - June 29, 2007.

IUCAA Preprints

Listed below are the IUCAA preprints released during October-December 2006. These can be obtained from the Librarian, IUCAA (library@iucaa.ernet.in).

S. N. Pandey, B. K. Sinha, and Raj Kumar, *An electrical spinning particle in Einstein's unified theory*, IUCAA-45/2006; Varun Sahni and Alexei Starobinsky, *Reconstructing dark energy*, IUCAA-46/2006; Anirudh Pradhan, Purnima Pandey and Sunil Kumar Singh, *Plane symmetric inhomogeneous cosmological models with a perfect fluid in general relativity*, IUCAA-47/2006; K.D. Patil and U.S. Thool, *Spherical and non-spherical gravitational collapse in monopole-anti-De Sitter-Vaidya spacetime*, IUCAA-48/2006; Arman Shafieloo, Tarun Souradeep, P. Manimaran, Prasanta K. Panigrahi, and Raghavan Rangarajan, *Features in the primordial spectrum from WMAP: A wavelet analysis*, IUCAA-49/2006; R. Srianand, Neeraj Gupta, and Patrick Petitjean, *Multiwavelength investigation of a near-solar metallicity sub-DLA at $z_{abs}=1.3647$ towards PKS 0237-233*, IUCAA- 50/2006; M.K. Patil, S.K. Pandey, D.K. Sahu, and Ajit Kembhavi, *Properties of dust in early-type galaxies*, IUCAA- 51/2006; Burin Gumjudpai, Tapan Naskar, and John Ward, *A quintessentially geometric model*, IUCAA- 52/2006; Arnab K. Ray, and Jayanta K. Bhattacharjee, *Static and dynamic aspects of transonicity in Bondi accretion*, IUCAA- 53/2006; Neeraj Gupta, R. Srianad, P. Petitjean, P. Khare, D.J. Saikia, and D.G. York, *Detecting cold gas at intermediate redshifts: GMRT survey using MgII systems*, IUCAA- 54/2006; Justin Khoury, and Maulik Parikh, *Mach's holographic principle*, IUCAA- 55/2006.

Pu La Deshpande's Birth Anniversary Celebrations

The 87th birth anniversary of Pu La Deshpande was celebrated at the Mukhtangan Vidnyan Shodhika, the Science Centre of IUCAA by arranging a four day programme for school students and teachers.

The "Pulastya" building for the Mukhtangan Vidnyan Shodhika was built from a donation received from Smt. Sunitabai Deshpande, relict of the famous P. L. Deshpande (Pu La).

The celebrations started on the November 8, 2006, with a talk in Marathi by J.V. Narlikar entitled, "*Ganitachi Vividhrangi Rupe*". Ninad Sheode from the University of Bremen, Germany, gave a talk about, "*Kya hai Ozone Hole?*" On the last day, Rajaram Nityananda, the Centre Director of NCRA-TIFR, Pune, gave the talk titled, "*Science Outside Classroom: Water*". It was followed

by an interactive session with school teachers on science teaching including easy scientific experiments and a mobile planetarium demonstration.

An exhibition on do-it-yourself (DIY) science experiments was set up for the school students. The unique feature of this exhibition was that the DIY experiments were demonstrated by the students of Huzurpaga and Aksharnandan schools, in Pune. A day-time introduction to sky watching was carried out using an advanced interactive software. A session on '*telescopes*' was conducted by the members of Akashmitra, an association of amateur astronomers.

More than 1000 students and 100 teachers participated in these celebrations.



The do-it-yourself experiments are being demonstrated by the students

IUCAA ASSOCIATESHIP PROGRAMME

IUCAA is a centre of excellence for research in Astronomy and Astrophysics and related subjects, and one of its mandates is to encourage research and development in these areas in the University sector. An important component of IUCAA's academic activities is the Associateship Programme, under which faculty members of Indian universities or colleges can visit IUCAA for periods of short and long durations over a span of three years, to develop their research interest and expertise.

During these visits, Associates can conduct their own research, or work in collaboration with faculty members at IUCAA, and with visitors from India and abroad. Associates can use facilities at IUCAA like the library, the advanced computing centre, and instrumentation laboratory. They can participate in observational programmes using national and international facilities, including IUCAA's own 2 m optical and infrared telescope set up at Girawali.

The Associateship Programme has been designed to promote mobility and to this end, the travel and local living expenses of an Associate for these visits will be borne by IUCAA as per its rules. Associates will continue to carry out the existing commitments at their parent organization. However, since IUCAA has been created by the UGC as a field station for these activities, it is expected that those visiting IUCAA under this programme will be treated as on duty by their respective organization.

Applications, on plain paper, are invited under this programme for the eighteenth batch of Visiting Associates for the period from August 1, 2007 to July 31, 2010. Interested persons should forward their application through the heads of their departments or institutions, along with their biodata, list of publications and a brief write-up on the work they intend to carry out as Associates of IUCAA. Applications should be sent to **The Coordinator, Core Programmes, IUCAA, Post Bag 4, Ganeshkhind, Pune 411 007**, (e-mail: vch@iucaa.ernet.in) so as to reach before April 30, 2007. In addition, each applicant should arrange for two experts in the field to send their confidential assessment of the applicant directly to the above address. Those who had applied last year, but were not selected, are requested to update their application if they would like to be considered again for a Visiting Associateship. The selected candidates will be informed by June 15, 2007.

Seminars

18.10.2006 Atul Deep on *The design and fabrication of near infrared PICNIC imager (NIPI)*; 24.11.2006 Vasudha Bhatnagar on *Knowledge discovery in databases*; 28.11.2006 K. Avinash on *New type of astrophysical objects*; 30.11.2006 Yogesh Wadadekar on *Bulge formation in lenticular galaxies: Violent relaxation or secular evolution?*; 01.12.2006 Lajos Balazs on *Angular distribution of GRBs*; 05.12.2006 W.H. Kegel on *Line formation in media with stochastic velocity fields*; 07.12.2006 Martin Lopez-Corredoira on *Galaxy-galaxy and galaxy-QSO discordant redshift associations*; 12.12.2006 Atish Kamble on *Multiband modeling of GRB afterglows*; 13.12.2006 Ashish Mahabal on *Science with synoptic sky surveys*; 14.12.2006 Habib Khosroshahi on *Properties of fossil galaxy groups*; 28.12.2006 William C. Saslaw on *Statistical mechanics of the cosmological many-body problem (and some of its implications)*.

Colloquia

09.10.2006 Vinod K. Gaur on *Experiments on two unique Indian terranes designed to resolve an outstanding question about planet Earth's continental lithosphere*; 14.11.2006 Nobuyuki Kanda on *The decade of TAMA300: From construction to searching for gravitational wave events*.

Visitors during October to December 2006

Vivek Agarwal, G. Ambika, Ravindra Amritkar, Manjiri Bagchi, Lajos G. Balazs, Raj Bali, Asit Banerjee, Mustansir Barma, Vasudha Bhatnagar, Sukanta Bose, David Buckley, Suresh Chandra, Phil Charles, S. Chatterjee, Tanuka Chatterjee, J.P. Chaturvedi, Sarbeshwar Chaudhuri, Laxmikant Chawre, Martin Lopez Corredoira, M.K. Das, Jishnu Dey, Mira Dey, L. Dorendro, Ranbir Dutt, Taparati Ganguly, Vinod Gaur, Maheswar Gopinath, P.S. Goraya, Rangarajan Govindan, K.P. Harikrishnan, Priya Hasan, Ng. Ibohal, Bhola Ishwar, Joe Jacob, N.K. Jain, Vinod Kumar Joshi, Kanti Jotania, N. Kanda, Suthikrishna Pratap Kaushik, W.H. Kegel, Farah Khan, Avinash Khare, Pushpa Khare, Habib Khosroshahi, Pravin Kokne, Amit Kumar, Avadesh Kumar, Sandeep Kumar, Nilesh Kumbhar, A.C. Kumbharkhane, M.L. Kurtadikar, B.S. Kushvah, M. Lakshmanan, Ashish Mahabal, T.K. Menon, Suryakumari Mithry, Alfred Molina, Pradip Mukherjee, S. Mukherjee, Muni Raj, P.G. Musrif, Ramamurthy K. Naidu, S.K. Pandey, Aseem Paranjape, A.K. Parate, Umesh Kumar Parekh, Moulik Parikh, K.D. Patil, M.K. Patil, B.C. Paul, Dilip Paul, Sajeeth Ninan Philip, A. Pradhan, Anagha Pujari, Hadi Rahmani, Anju Rai, G. Rajasekaran, S. Rajesh, Vivekananda Rao, C.D. Ravikumar, Arnab Ray, Ashim Roy, L.M. Saha, Sanjay Kumar Sahay, Sandeep Sahijpal, Kamal Kant Sharma, Nardeep Kumar Sharma, Subodh Sharma, Shirish Shevade, S.V. Shinde, Yuri Shtanov, Anvar Shukurov, B.K. Sinha, Anupa Sridhar, Sriram, K. Subramaniam, Yasuo Tanaka, Saeid Tavasoli, A. Tej, S. Thorat, R. Tikekar, Aphisit Ungkitchanukit, D.B. Vaidya, V. Vinu, C.V. Vishveshwara, A. Viznyuk, Yogesh Wadadekar, Ted Williams, Mahesh Kumar Yadav, R.S. Yannawar, S.S. Zade, L. Sriram Kumar, Mina Koleva, T.P. Prabhu, Ram Sagar, H.P. Singh, Sanjay Kumar Pandey, P.N. Pandita, William Saslaw, J. Ehlers, Tarun Saini, Prugneil Phillip, S. Guha, Ananthamurthy U.R., and Judith Perry.

Visitors expected

January

Fayad Ahmad Nazar, Univ. of Kashmir; Jayashree Roy, Assam Univ.; Samridhi Kulkarni, Pt. Ravishankar Shukla Univ.; Aheibam Keswerjit, Univ. of Delhi; Jotin Singh, Univ. of Delhi; Aparna Venkatesan, University of San Francisco, USA; Pammy Manchanda, Guru Nanak Dev Univ.; A. Usmani, Aligarh Muslim Univ.; Rabin Chhetri, Sikkim Govt. College, Gangtok; Gulab Dewangan, Chennai; A.K. Sen, Assam Univ.; Gaur Bhattacharyya, Presidency College, Kolkata; Narayan Banerjee, Jadavpur Univ; Gary Ferland, Univ. of Kentucky, USA; Asantha Coorey, UC, Irvine; Arindam Mukherjee, North Bengal Univ.; A.K. Sen, Assam Univ., A. Gopakumar, Friedrich Schiller Institut, Jena, Germany; Kailash Sahu, STSCI, USA; Gaur Bhattacharyya, Presidency College, Kolkata; Narayan Banerjee, Jadavpur Univ.; Praveen Puri, Sikkim Govt. College; Sima Ghassemi, IPM, Tehran; Anil Kakodkar, Dept. of Atomic Energy, Mumbai; T.R. Kem, UGC, Delhi; Amitava Raychaudhuri, HRI, Allahabad; R.C. Sobti, Panjab Univ.; P. Prugniel, Observorory de Lyon, France; Christian Boily, Observatoire Astronomique, France; Tarun Saini, IISc.; T.K. Menon, Univ. of British Columbia, Canada; A. Starobinsky, Landau Inst. for Theoretical Physics, Russia; and Ibrar Hussain, National University of Science and Technology, Pakistan.

February

Antonella M., Max Plank Institute, Germany.

Annual Report 2005-2006

The IUCAA Annual Report (2005-2006) is now electronically available and is linked to the IUCAA Home page.

The downloadable pdf file of the complete Annual Report is available at the URL http://www.iucaa.ernet.in/html/research_public_annual.htm. In case you run into any difficulty in downloading the file please email us at: publ@iucaa.ernet.in.

From this year onwards, we will make the electronic version of the Annual Report available on the homepage and eliminate bulk mailing. Please let us have your email address to which we can send notification regarding the availability of future annual reports. This address may be sent to us at: publ@iucaa.ernet.in.

Editor

A comet is orbiting the Sun in a parabolic orbit with its closest point of approach being inside Earth's orbit (which, for simplicity, is taken to be circular). What is the maximum number of days the comet's trajectory can be within the orbit of Earth?

Solution to For the Younger Minds - 18

Let the length of the side wall of the aquarium be l and the (maximum) height of the meniscus be h . Consider the forces acting on the column of water in the region of the meniscus. The surface tension pulls it away from the glass wall with a force $l\sigma$, where σ is the surface tension of water. The external air pressure P_0 exerts a force lhP_0 towards the wall. The reaction force at the wall is equal to the mean pressure exerted by the water column, which is $lh[P_0 - (1/2)\rho gh]$. (Since the pressure of water changes linearly with increasing height, the average pressure has the $(1/2)h$ factor.) Force balance requires $lh[P_0 - (1/2)\rho gh] - lhP_0 + l\sigma = 0$. Solving, we find $h = (2\sigma/\rho g)^{1/2} \approx 3$ mm which is not unreasonable.

Know Thy Trees - 4

Arvind Gupta and Arvind Paranjpye

The Purple Bauhinia (*Bauhinia Purpuria*)

Take a walk to the greenhouse near Aditi, our very first building. Facing the greenhouse to your right you can see a medium size tree with delicate purple flowers – this tree is *Bauhinia Purpuria* (pronounced as baw-HIN-ee-uh pur-PUR-ee-uh).

Carl Linnaeus, the Swedish botanist who classified plants, gave the name *Bauhinia* to a genus in honour of two German botanists John and Gasper Bauhin of the 16th century. The bi-lobed, twin leaves of *Bauhinia* were a fitting tribute to the memory of these twin botanists. *Purpuria* refers to the colour of the flowers.

The tree grows wild sporadically throughout India, particularly in the hill tracts. It is frequently cultivated for its showy flowers. The tree can grow to a height of 40-50 ft. Leaves are simple, bi-lobed, 4 to 5 inches in diameter, with two separate lobes. The bi-lobed leaves of another *Bauhinia* (locally called apta) are gifted during the festival of Dussehra.

The tree yields a gum. The bark yields a fibre, and is also used in dyeing and tanning. The wood is used for making agricultural implements and for buildings. The leaves are used as fodder, and the flowers are used as herb in making curries and also made into pickle (chutni).

The flowers appear after the rainy season and the fruits remain on the trees till the next summer season. *Bauhinia* species grow easily from seeds and bloom within 3 to 4 years.

The green finger for this tree: Planted by Professor R. P. Bambah, on December 28, 1998.



***Khagol* (the Celestial Sphere) is the quarterly bulletin of IUCAA. We welcome your responses at the following address:**

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