

National Seminar on Women  
Leadership in S & T:  
Opportunities & Challenges

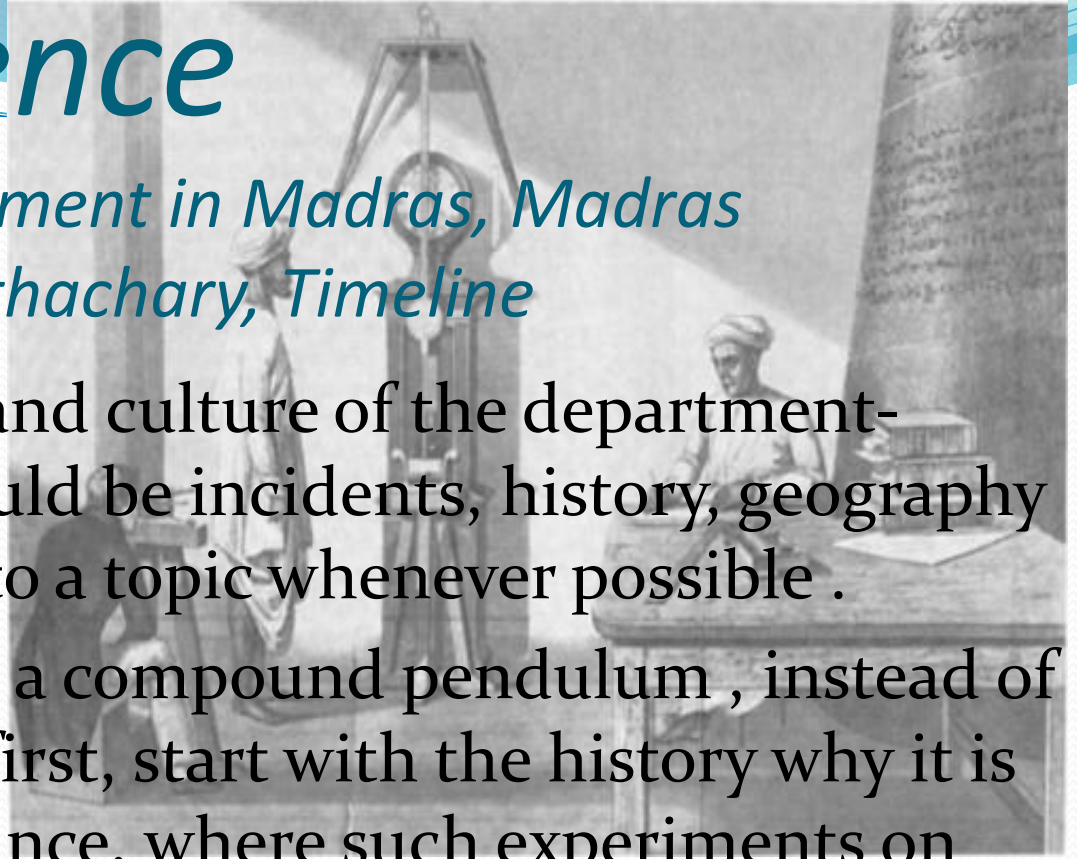
Reaching out through  
Science Outreach –

Uthra Dorairajan








# Talking Science

*Kater's Pendulum experiment in Madras, Madras Observatory, Rangoonathachary, Timeline*

- Thanks to my seniors and culture of the department- Discussing science, could be incidents, history, geography or technology related to a topic whenever possible .
- “While teaching about a compound pendulum , instead of doing big derivations first, start with the history why it is important, its significance, where such experiments on time was carried out, the need and make the students get interested in the topic, then start derivations. That will make sense”.
- I evolved my method of talking Science, not just lecturing.
- This helped me stand-out everywhere and students could connect with Science instantaneously.



# Print media AIR/ FM/ DD

- My articles and stories on evolution of various scientific facts/inventions/technology in Tamil were well received, by my own students and everywhere I visited.
- low cost science magazines look out for Science articles  circulation in schools  School Science shows and Project days  Intertaction with Children  motivated/ pointed out need for missing links  **URGENT** Need to **help**/ motivate/ inspire/ mould TEACHERS
- **My colleagues** too joined, as there is so much to be done in science communication in Tamil, but no takers.
- print media  AIR/DD  speak in All India Radio on Science everyday for five minute slots. we have to be spontaneous, heard by many many from all fields, need to talk on science, **not just our own discipline and in non-technical language, and not dilute the talk too.**







# Toddlers ya Teens



Catch them young applies here. Science exhibitions, school day, National Science Day talk- call it whatever one likes, **but speaking science is needed**. No lectures, No Advice to children. Children love stories, I design my story telling ( not fiction) that **they can tell their moms**. I write stories, that appeal moms to tell children. This is my ideology again!! BUT WHY MOMS??? 😊

# Chance to assess and outreach



## according to needs

- These opportunities gives chance to interact with school Principals, Science teachers- middle, high, primary and **B.Ed. trainee teachers**
- Being a teacher of M.Sc., what kind of Science graduates, aspirant teachers are we creating???
- For our next gen to be inquiry based, are we teaching the post grads, teachers about INQUIRY, how can then I talk about SCIENCE?
- Do they have access? Facilities? Do they know to tap various resources? How will they empower themselves? Where do we lack, inspite of motivated teachers, enthusiastic children? - These questions bothered me a lot
- This lead to creating resources – dubbings, translations , website, fb – but needed much more support, there came DBT STAR SUPPORT SCHEME
-

# Various Training Progs For Teachers



# Outreach to SEEK other outreaches too

**DWARAKA DOSS GOVERDHAN DOSS  
VAISHNAV COLLEGE**  
(Autonomous, Reaccredited at A grade by NAAC)  
&  
**FEDERATION OF SCIENCE CLUBS OF TAMILNADU**  


**Welcome You All**

Two Day Refresher Programme in Physics Practicals for  
*PG Teachers of Chennai Corporation &  
Govt. Aided Schools*

18-19, November 2013

Under the support of  
DBT STAR College Scheme  
Dept. of Biotechnology, Government of India



Welcome You All  
for the two day workshop on  
*'Conservation of Museum Objects'*  
23-24, September 2013  
Under the support of  
DBT STAR College Scheme,  
Dept. of Biotechnology, Government of India





S.Saranya Devi,- “students prefer such co-curricular activities and welcome such training programmes,like boquet making and fresh flower arrangement (by TNAU) as they become more employable.” III Physics (2013-14)

SenthuraPandi is from a family that makes garlands and sells in market. He belongs to a poor family. After this workshop, he felt so proud about the job his family has been practicing for ages. He was thrilled about supplying garlands to the temples, after that. Those who attended this workshop and wanted to take it further, formed a small team and started decorating during many programmes in the College.

- Dubbings of arvindgupta toys from trash (came to know thro IITM Physics outreach)- 300+, now... -TAMIL medium students
- Translation of Maths materials for class 7 for Gyanome by our students



- **Permission from the authorities/heads** to involve students(volunteers) from different classes, departments was much easier now as we could say “DBT activity”! 😊 Outcome after using these in schools is awesome. And the feel-good feeling students got must be mentioned.
- To buy popular science books from NBT, Vigyan Prasar, CSIR, to create the right kind of environment
- To buy small articles for our new approach, to try arvindgupta or foldscope, we need space, time, money, people, STUDENTS –DBT STAR SUPPORT
- Certificates and credits were the initial hooks
- Look Science as a single entity, look for interdisciplinary work culture to give the thrill, to enthuse, to create much needed cheerfulness.
- **IT WORKS!!!!** 😊

# Seeds grows with a little nurturing





Watchman turned to writer, gardener, scholar too....Outreach binds people, helps to bloom out, because it is voluntary, unconditional 😊Pls look at the cheerfulness

# But how to...

- seek help
- seek source of information
- give due credits/encourage at right time
- pat others and ourselves and recognise
- keep re-inventing, improving
- Constantly, consistently....
- Because IT IS OUTREACH
- And we need to build this CULTURE
- SOCIAL MEDIA – blogs, facebook, watsup gave us necessary impetus and momentum and networking
- and not to forget supplements of daily newspaper
- IT guys with passion for history/technology/ writing /films

Proud to share trilingual books from our students in archives.org

Dubbing of Arvind guptaji reached 300 from our group. SCERT has completed dubbing of all videos in Tamil. Outreach groups evolved

The screenshot shows a web browser window displaying the Internet Archive page for 'THE LIBRARIAN OF BASRA - TAMIL - BHAVANI'. The browser's address bar shows the URL: <https://archive.org/details/TheLibrarianOfBasra-Ta>. The page content includes a thumbnail of the book cover, which features a woman and a house, and the title in both Hindi and English. Below the thumbnail, the title 'THE LIBRARIAN OF BASRA - TAMIL - BHAVANI' is displayed, along with the author 'by BHAVANI'. The page also shows 'Topics TAMIL, CHILDREN'S STORY, ANTI WAR' and a 'SHOW MORE' button. On the right side, there is a 'DOWNLOAD OPTIONS' section with a table listing available formats: ABBYY GZ (1 file), DAISY (1 file), and EPUB (1 file).

THE LIBRARIAN OF BASRA - TAMIL - BHAVANI

by BHAVANI

Topics TAMIL, CHILDREN'S STORY, ANTI WAR

SHOW MORE

DOWNLOAD OPTIONS

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# Translation of excellent works on education and Science.

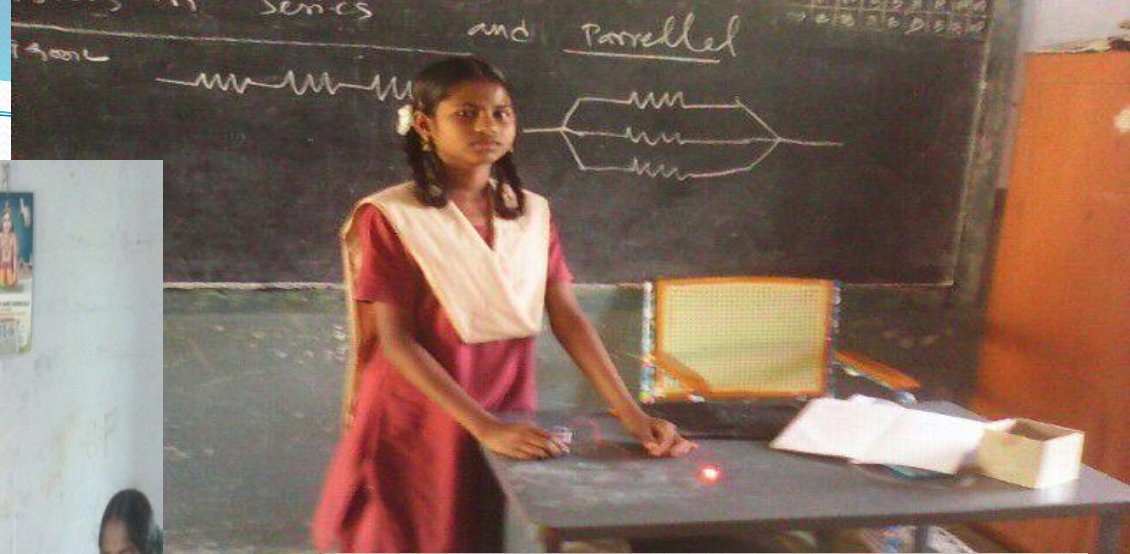
- **Knowledge without Borders** by the famous scientist Pierrie Petit
- There is a huge **collection of books** lying there, awaiting translators in Indian language.
- Arvind Gupta website is a source for us to choose what we want to translate. He suggests me on the books that I should take up.  
There is a need for simple hands-on activities- Arvindgupta website, Agasthya Fopundation, Hoshiangabad Science Centre, IISc Talent development centre, TIFR outreach,...
- I guess somewhere due to lack of these, many school children shy away from science group. But Scientific bent of mind, rational thinking is there. So catch them thro communication, for which hands- on gives opportunity and builds the confidence of the science grads.

# Kinesthetic and Tactile Learners

- It is almost non-existing in usual school method.
- What do we do for them? Connect with schools and my own experience in College troubled me with this question?
- DBT Interdisciplinary activities, hands-on trainings helped us to spot them
- They are the ones we see during NSS, NCC, culturals, what not, now Science outreach too...
- They long for learning that suits their own learning system
- My work with NIOS, Dyslexics, trainings that I underwent to learn about dyslexia (Madras Dyslexia Association), SLD made me ponder more
- Every school I addressed, I made people feel ☹️

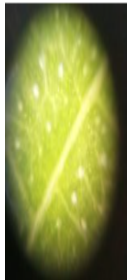
# Door opened with social media being the binder

- By 2014, RMSA started a pilot project for 100 Government Schools in TN for class 6-9 to give hands-on skills under STEM.
- Schools (village) noted increased attendance % on hands-on activity days . RMSA to RAA school adoption !
- This helps many children enjoy science and develop inquisitiveness
- These school teachers were given tabs loaded with experiments in science.
- Facebook brought many of the ICT school champions together
- Weekly target to do experiment in Physics, Chemistry, Biology for class 6 – 9 helped us break the barriers. Watsup, cellphone camera did magic
- They learnt to see the entire progress as **“Science”, breaking the barriers.**
- Many of the teachers **turned into mentors**, an idea which definitely the DBT Star Programme gave us.
- Now many organisations are looking for mentoring before science exhibitions –IITM with IWMA



# DGVC-Physics

Posted by DGVC-STUDENTS on MARCH 5, 2017



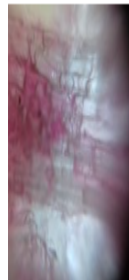
*don't think its lays...but it is mosquito wing*



*yellow candies*

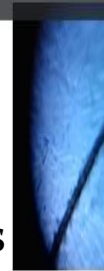


*the wall of cells*



*guess this sweet thing tat add sugar to ur food*

Physics looks at –  
 Leaf of custard apple  
 Mosquito wing  
 Pollen grains of Hibiscus rosasinensis  
 Cells in Outer peel of onion  
 Feather  
 Sugarcane – PONGAL Hols!!  
 Mosquito proboscis  
 Cumin stalk  
 Cumin cuminum again  
 Glucose  
 Sugar  
 Vicks  
 Dals at home



*dill mage more.....blood*



*Stalk of cumin*



*Not a planet, just a part of a plant*



*Glucose*



*Sugar crystal*



*Vicks piece*



# Foldscope story- Outreach helps

- Keep eye on various outreach, track them if it serves our purpose
- Keep banging the doors
- Outreach to seek help and help
- Media helps to network and sieve
- Thanks to DBT, we helped TNSF Madurai foldscope community to arranged programme for children and to kickstart (Nov, 2016)
- In Chennai, thanks to them, two of my students got opportunity to learn from MKU Prof.(Dec, 2016)
- Now we have started a community, and it will spread soon



https://microcosmos.foldscope.com/?p=23169

File Edit View Favorites Tools Help

Introduction to Communi... course ICT Integration in ... Twitter Inbox Gmail Yahoo mail Facebook ESPN Cricinfo

# Microcosmos

WHAT IS FOLDSCOPE? ASSEMBLY/USAGE TUTORIALS LOGIN

*Dryyyyyyy grapesssss*

*Spider legs*

*i just took a small piece of sand and just a made slide of it and just viewed under a mini microscope (foldscope) was amazed it looked like a small honey comb...!!*

*i just placed a fish scale that too a pond fish i just cleaned it and i took a scale of it and made a slide,i felt like scale glittered like a silver*

*once my new shirt was torn while playing so i asked my mom to stich it ,as it was a red cloth,mom tooked a red thread so mind stucked to view thread under the foldscope.i took a small piece of short length and then i made into slide and placed it on red something different it was something like*

*Leaf's mid rib*

Students Take off, No-stop flight. Our FOLDSCOPE leaders looking at Biology thro' different eyes, learning materials science! Physics, Chemistry, biology culminates as materials, nano....

11:33

## ● *Budding Science Ambassadors*

- A systematic planning and execution can help us transform these young people into science ambassadors.
- Children are good observers.
- With a little motivation and sustained guidance, many of them can be trained. Teachers, science communicators, authors, storytellers and science enthusiasts can come forward to build such a strong force for a strong tomorrow.
- The big question is, how?
- How are even we going to network?
- Are we already not too late?
- When are we going to prepare minds of public for so many projects, policies, changes? How? Who?

- *“Oh! All these years I thought of the Bordeaux Mixture as nothing more than a chemical and learnt the chemical formula by rote. Now I know that Bordeaux is in France where there were hundreds of vineyards. And that being the people’s main source of income, they desperately needed to solve pest infestation of grapes. PMA Millardet, a professor of botany, found that grape vines closest to the roads did not suffer the pest attacks, because grape farmers traditionally sprayed them with a mixture of copper sulphate and lime, to prevent passersby from eating them. He conducted several tests and found that that mixture could be used to contro pest. Hearing this story, I feel that science cannot be segregated from geography, economics or other streams of knowledge.”*
- 
- This is what a school kid told me when I interacted with him. And listening to him, his friend said, “Bingo! I will tell this to my little sister.” This is how science can take wings, very young and blithe wings.

- Where do we miss out?
- In identifying the resources?, targets? informing them and integrating them?
- Online courses on science communication (ISCOS)
- Science animations, films
- Blogs, worksheets, videos or short films on science can bring in creative people to our fold and give a new dimension to learning science.
- The minute this is done, we can expect some change to follow in the next few decades.
- A platform that integrates and takes it to the common people is what is needed.
- A movement where ideas and information can be disseminated in various languages using technology is long awaited.
- Time has come to unleash the power of science communication, that is waiting to be unfolded.
- And this is the right time to do it!

# Network in IT age- We need more Lilavati's daughters?

- Vigyan Prasar - NBT – CBT- Hoshiangabad -Vikram sarabhai - IISC outreach - TIFR outreach – can we have a outreach network portal? One stop like Shakshaat
- Child friendly
- Helps in easy and friendly access to parents, teachers
- Dubbings of science videos, TV shows- AMUL Surabhi that fired many of our thought process
- history of Science/ scientists/ food/ textile/flora and fauna
- Multi-linguistic country – many of us can be roped in
- Techies to be involved

# Can we accelerate this through

- NAAC recognition- RECOGNITION to teachers
- Small projects from UGC on science popularisation
- Drones- bird eye view- NAAC, autonomy commissions, ISO certificate reports can pool us together
- More work through print media, education supplements of mainstream magazines, translations, videos, short films
- Info dissemination of completed projects, needy areas
- Low cost books/ science magazines

I will be a hummingbird - Wangari Maathai (English)



*"I will be a hummingbird"*



And Many...