Models for Collaboration

Development of Technologies / Systems / Processes

Dr. U. Chandrasekhar
Director
ESCI, The Institution of Engineers (India)
Hyderabad

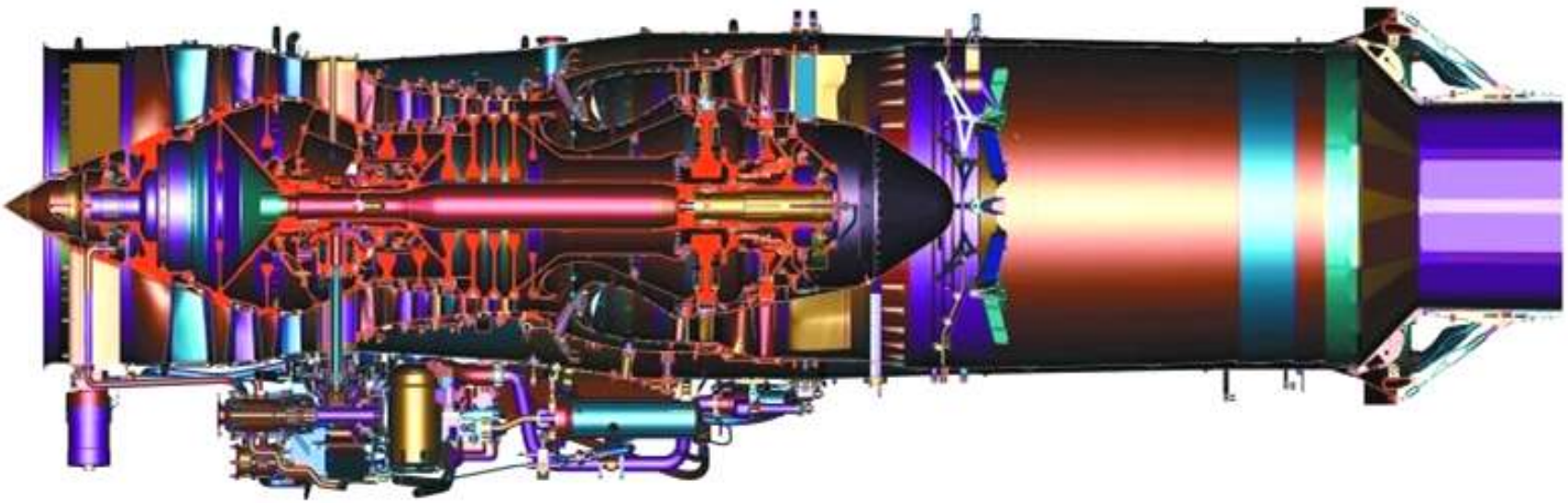
Technology Areas for Illustration

- Thin Film Sensors for High Temperatures
- Micro Air Vehicles
- Additive Manufacturing with Metals
- CATE – Computer Aided Tissue Engineering

Primary Stake Holders

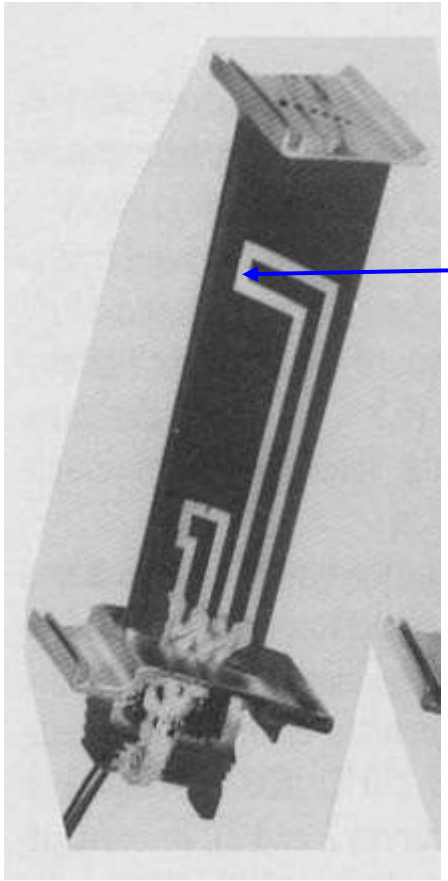
- DST
- DRDO
- IIT – Bombay / IISc / Jain Univeristy
- NDRF – the Institution of Engineers
- NRC, Canada

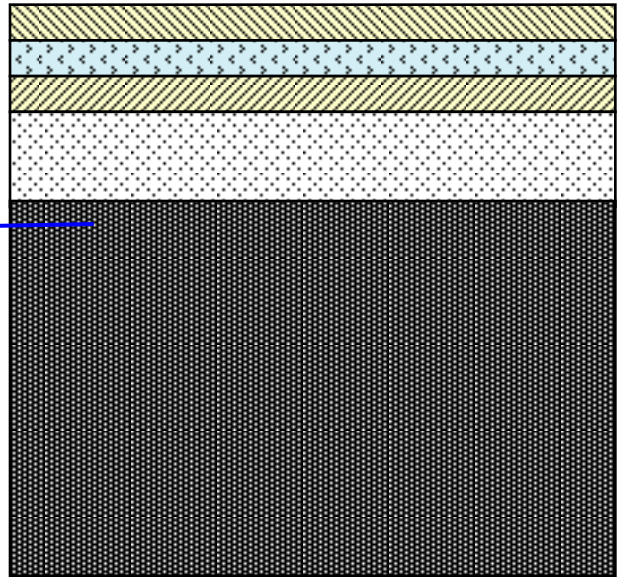
Thin Film Sensors for High Tempeartiures



High Temperatures/ Pressures / High Rotational Speeds

Health Monitoring requires of Harsh Environment Sensors





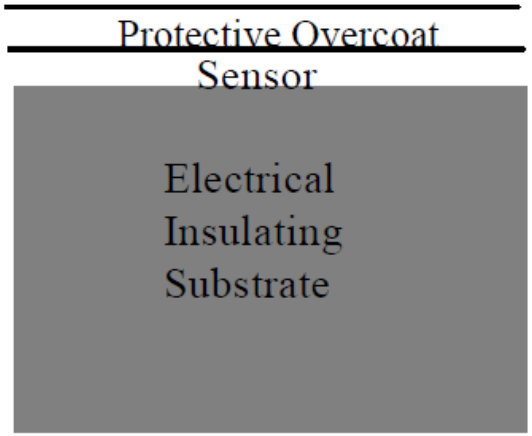
Top Al_2O_3 Layer (0.5-2μm)
Sensor Element Layer (0.5-2μm)
FeCrAlY Layer (~50μm)
Al_2O_3 Insulating Layer (5-8μm)

Blade Base Material

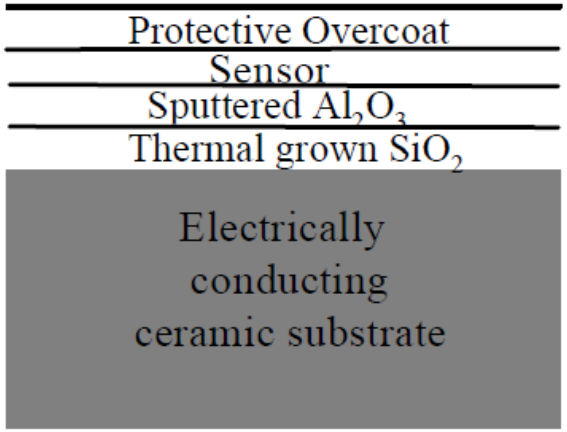
Major Technologies : Surface Engineerinf, Extrusion Honing, Sputtering, E Beam Evaporation, Flexible Mask Preparation, Photolithography, Laser Micro Machining, Splicing,

Sensor Characterisation – TCR / GF / Drift / Apparent Strain, Hot Gas Testing,

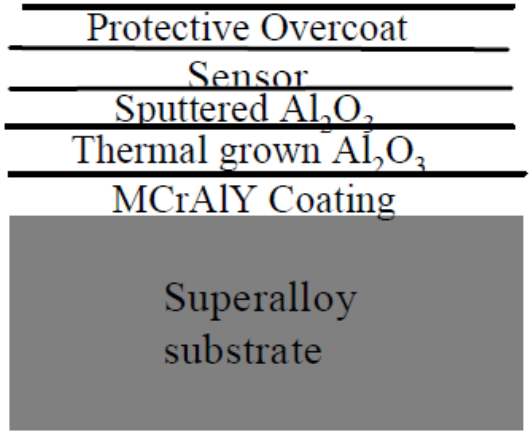
Gage Lead out Design – Splicing



Silicon nitride
Aluminum oxide
Mullite



Silicon carbide



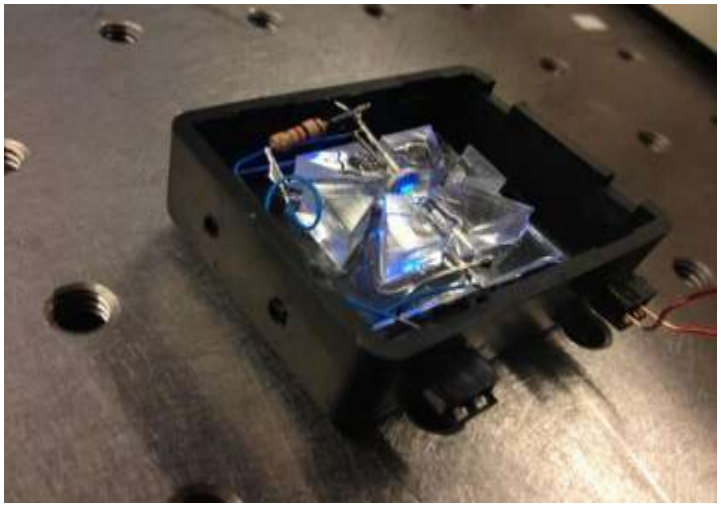
Superalloys

Ref: NASA Technical Memorandum 107418, Advances in Thin Film Sensor Technologies for Engine Applications, Jih-Fen Lei, Army Research Laboratory, Lewis Research Center, Cleveland, Ohio

Thin Film Sensors for Gas Turbines

- Development of thin film sensors for gas turbine blades / NGVs
- Sensor Design / Deposition / HT Characterisation
- Partners – GTRE / NRC, Canada / (NFTDC / IISc)
- 3 year project – funding from Special TD Project of DRDO

Ammonia Detection Sensor for MAV



Partners and Roles

Jain University Team – Sensor Material Development

Concordia University – Device Development / Packaging

DRONE – Flight Trials / Validation

NDRF, IE (I) – Overall Project Coordination

MICRO AIR VEHICLE (MICAV) MISSIONS

Disaster Management

- Fire
- Floods
- Earthquakes
- Landslides
- Gas Leaks
- Search & Rescue

Defence / Security

- Surveillance
- Recce
- Communication Relay
- Electronic Warfare
- NBC detection
- Explosive / Mine detection
- Riot Control
- Crowd Monitoring
- Traffic Control

Commercial

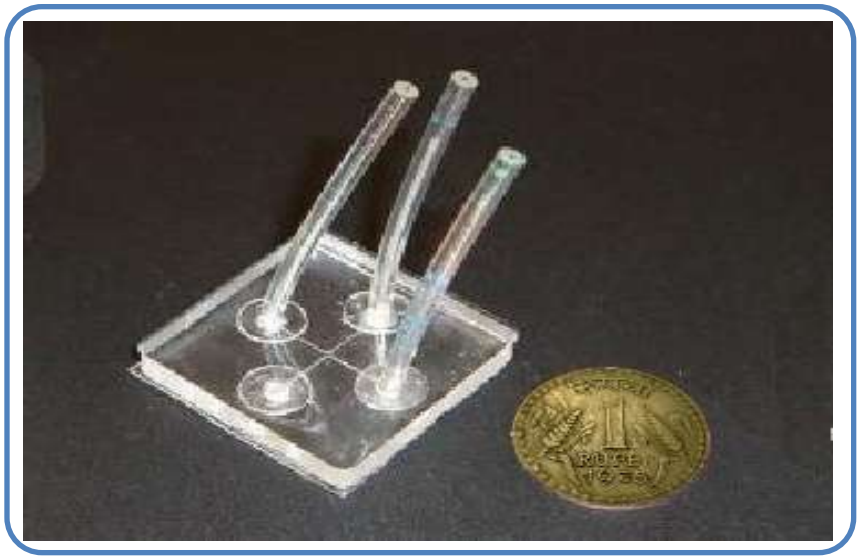
Photography

- Television
- Cinema
- Agriculture

Research & Development

Evaluation of new concepts

Ammonia Detection Sensor for MAV



Partners – Concordia University / NDRF, the Institution of Engineers (India) / Jain University / Drone Aerospace

Funded by – ARDB – NPMICAV, DRDO

Sensor developed with in weight budget of 6 gms / Human Resource Exchange

Integration with micro air vehicle / Monitoring the traces of Ammonia leak

Experiences Gained

- Clarity on Outcome (Product / System / Device / Process)
- **Evaluating the Partner's Strengths (Infrastructure / Human Resources)**
- Currency of Research Interests
- **Define the Roles with Adequate Specificity / Mutual Respect**
- Build in flexibility in terms of interaction, but Identify a Pathway for Collaboration
- **Funding Source (Neutral Bodies / National Bodies / Project Calls)**
- Less Stress on IF Development / More on IP generation
- **Clearances from respective authorities and bodies that govern IP sharing**
- Be patient / be persistent - Rich and mutually gainful Outcomes

www.indiaInnovates.in

Department of Science & Technology
Government of India

LOCKHEED MARTIN

FICCI

IUSSTF
Indo-US Science and Technology Forum

STANFORD GRADUATE SCHOOL OF BUSINESS

IC2 INSTITUTE

Home | About Program | Program Process | Program Benefits | Technologies | Partners | Downloads | News | FAQs | Contact | Login

NEWS 〉 nd Earth Sciences, Government of India, at the Millennium Alliance Awar

Enter keywords of Technology to search

Aerospace and Defense; Technology and Services

Agricultural and Forestry

Automotive

Chemicals

Communications

Construction and Real Estate

Consumer Packaged Goods

Energy and Utilities

Environmental and Waste Management Services

Financial Services

Industrial Goods and Machinery

Ingredients

26th Feb., 2014 – Times of India

THE TIMES OF INDIA Science

Search

Advanced Search »

Home | City | India | World | Business | Tech | Sports | Entertainment | Life & Style | Travel | Women | Spirituality | NRI | Real Estate | Photos | Times Now | Videos

Opinion | Blogs | Auto | Polls | Speak Out | Science | Environment | Education | DAY IN PICS | STOI | Headlines | Specials | Campaigns | Classifieds | ePaper | Speed News | Mobile Apps

Mocktale

You are here: Home » Science

RELATED KEYWORDS: NASA-Satellites | NASA | ISRO | International-Space-Station

Nasa to launch satellite in collaboration with Isro

PTI | Feb 26, 2014, 09.31AM IST

WASHINGTON: US space agency Nasa said it would launch a water-related satellite in collaboration with India's Isro.

The Nasa-Indian Space Research Organisation Synthetic Aperture Radar mission is a part of its plan to launch in the next seven years a series of satellite related to water and drought, the agency said.

Among others include the Ice, Cloud, and land Elevation Satellite-2 (ICESat-2); Gravity Recovery and Climate Experiment (GRACE) Follow-on and Surface Water Ocean Topography mission.

RELATED ARTICLES

- Nasa discovers new gully on Mars

25th July, 2013 – Time of India

RELATED KEYWORDS: Vice-President | Joe-Biden | Indian-Institute-Of-Technology-Bombay | IIT-B

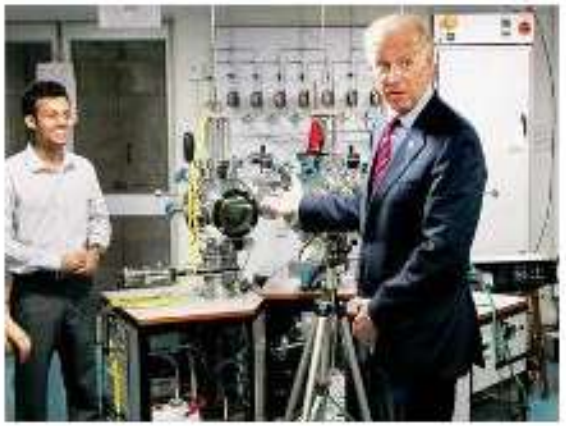
IIT-B one of the best in world: US vice-president Joe Biden

PTI | Jul 25, 2013, 09.41PM IST

MUMBAI: US vice-president Joe Biden today hailed the premier Indian Institute of Technology-Bombay as "one of the leading" technology schools in the world that left him "extremely impressed".

"I have been extremely impressed. This is a great university, one of the leading universities in the world in the field of technology," he said after visiting various laboratories and interacting with students on the campus. Biden's comments came amid talk of declining standards of education in the country.

After visiting the departments of Nano Technology and Earth Sciences, he held a closed-door meeting with female students pursuing doctoral studies in multiple disciplines.



Biden today hailed the premier IIT-Bombay as "one of the leading" technology schools in the world that left him "extremely impressed".

United States - India Science and Technology
ENDOWMENT FUND
"Third Call for Executive Summary"

The governments of the United States of America (through the Department of State) and India (through the Department of Science & Technology) have established the United States - India Science & Technology Endowment Fund for promotion of joint activities that would lead to innovation and techno-preneurship through the application of science and technology.

The aim of the Fund is to support and foster joint applied R&D to generate public good through commercialization of technology achieved through sustained partnerships between US and Indian researchers and entrepreneurs.

Healthy individual: Affordable biomedical devices, diagnostic / preventive / curative measures, or food and nutrition products to improve health.

Empowering citizens: Reducing the digital/technology divide. Technologies with societal impact in areas such as water, agriculture, financial inclusion, and education.

THANK YOU