



# IIT Mandi 1<sup>st</sup> Alumni Meeting

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Director  
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Jan '14





# 2011: North & South Campus





# Vision

to be a leader in science and technology  
education, knowledge creation and  
**innovation,**  
in an India that is marching towards a  
**just, inclusive and sustainable society** 3



# Towards Innovation

## Inter-disciplinary academic culture

### Design-oriented B.Tech. curriculum

Real-world team projects from Year 1 to 4

#### Ingredients:

Learn-by-doing,  
teamwork, driven by  
needs of society,  
strong humanities  
component

1<sup>st</sup> Yr

Reverse  
Engineering

2<sup>nd</sup> Yr

Product  
Development

3<sup>rd</sup> Yr

Technology &  
society

4<sup>th</sup> Yr

Major technical  
project – product,  
patent, publish

Students develop  
practical devices that meet  
real-world needs





# IIT Mandi Strategy

- **Focus on a few areas** – based on regional and national relevance
- **Partnerships** with like-minded institutions in India and abroad
  - IIT-M, IIT-D, IIT-K, IIT-B, IIT-R, IIT-H, IIT-Ropar, IISc
  - TU9 MOU May 2011 – Rs. 3+ crores (€450K+) from India and Germany for exchange of faculty
  - NMSWorks, BHEL, Aindra, SCL, Sangha Seeds, ...  
US: Purdue Pharma, Intel, RxDataScience, ...
- **Inter-disciplinary** culture, organisation, academics



# Focus: Materials

## Advanced Materials Research Centre

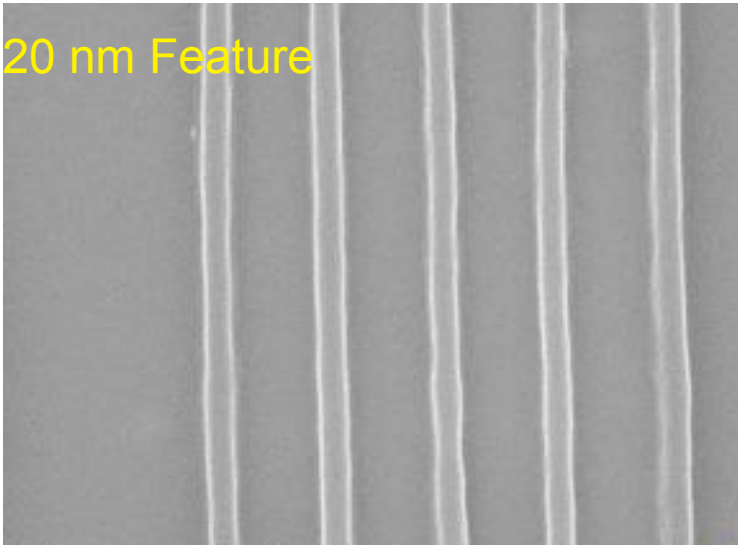
### Centre for Fabrication & Design of Microelectronics

- 2 Distinguished Professors + 25 young faculty with expertise in materials
  - from molecules to devices to applications
- National needs: Electronics, electrical, biomedical applications
- Sophisticated instruments
  - 50 cr / \$8m installed + 20 cr / \$3m ordered
- \$315,000 from Intel for next-gen VLSI photo-resists
  - State-of-the-art: 22 nm
  - IIT Mandi: 20 nm, 15 nm, 10 nm
  - Network of labs in India, Brazil, Mexico & US

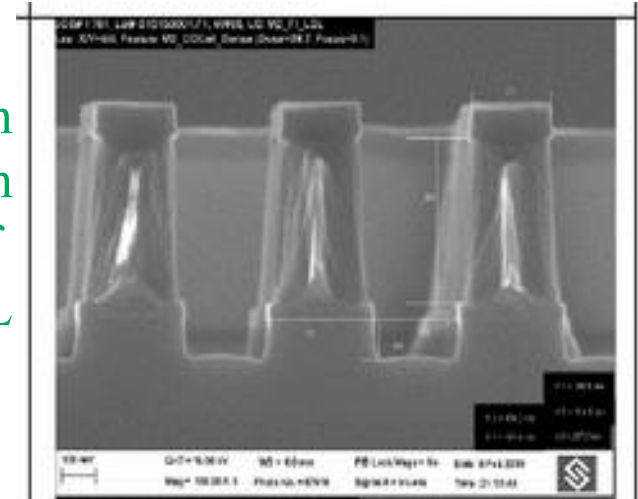
Intel US, \$300K in  
2012: <22nm

# VLSI Resists

20 nm Feature

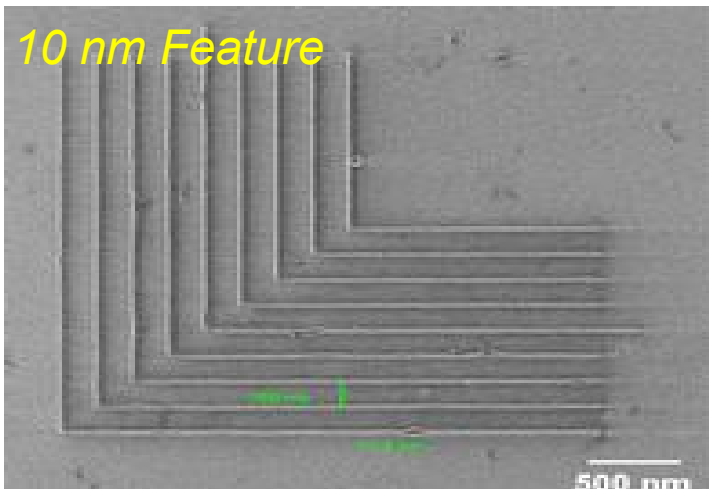


Validation  
at 180 nm  
fab line of  
SCL



2018

10 nm Feature



IIT Mandi indigenizing  
11 out of 34 chemicals  
used at SCL, Mohali

**Indian patents filed**

No. 201611044190

No. 201611018061

No. 201611022219



# MANAS

## *Multimedia Analytics Networks Systems*

### Detection of cervical cancer cells

- With KIDWAI Memorial Institute of Oncology, PGI Chandigarh, Aindra Pvt. Ltd, Bangalore

### Low-cost point-of-care diagnostic devices

- 0.2 Tesla portable MRI @Rs. 30 lakhs

### Machine learning for telecom network management

- NMSWorks Software Ltd, Chennai  
2 Mentor Profs + 10 young faculty, 10 cr projects





# BioX Centre – systems and synthetic biology

High-throughput  
phenotyping in  
agriculture  
Systems  
analysis  
of crop  
pathogens

Agricultural  
practices in  
the  
Himalayan  
region

Himalayan  
Biodiversity for  
biotech  
applications

Disease  
Prevention  
and  
Affordable  
Health Care

Devices & Instrumentation

Biomechanics  
Bio Imaging  
Nanobiotech  
Biomaterials  
Theranostics

Natural  
Products  
for Health  
and Industry

Novel  
microbes  
in extreme  
environments  
for industrial and  
biotech applications

22 faculty  
Rs. 15 cr projects

# FarmerZone: A DBT Initiative



Lead: IIT Mandi

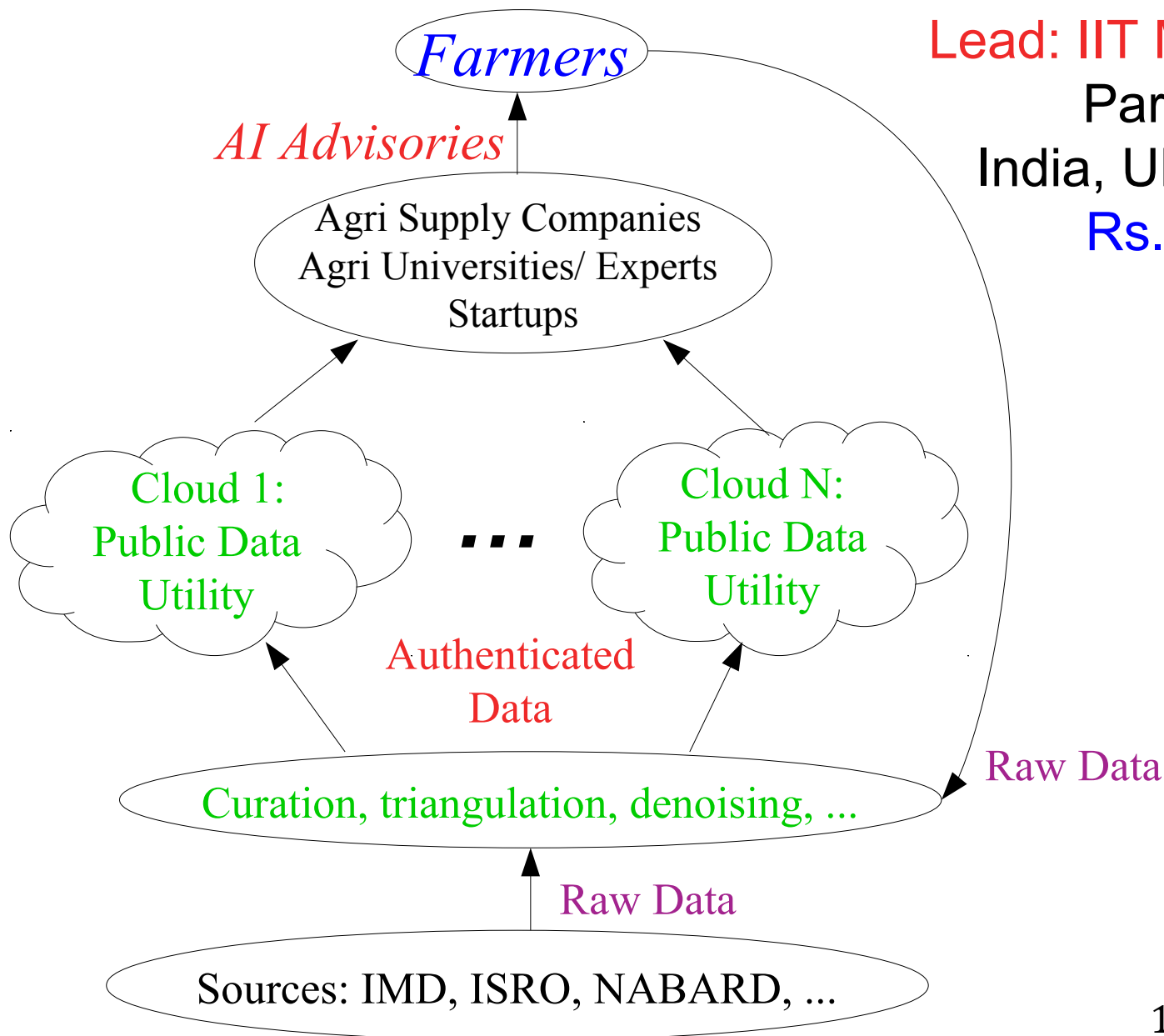
Partners:

India, UK, US

Rs. 10 cr

Industry  
Ecosystem

Govt  
funded



## Goal: e-transportation for India by 2030

- Renewable energy sources
- Materials for high density energy storage, fuel cells, carbon sequestration, ...
- 12 faculty + 1 mentor professor
  - Rs. 5 crores sponsored projects
- **eMandi**: Project to convert Mandi district to e-autos in 2-3 years





# Numbers

	2013	2017	2019	2029
BTech	478 (3)	530 (4)	800 (5)	2000 (6)
MTech/MSc		170 (8)	400 (12)	1000 (22)
MS/PhD	108	<b>300</b>	400	<b>2000</b>
<b>Total</b>	<b>586</b>	<b>1000</b>	1600	<b>5000</b>
Faculty	55	<b>104</b>	160	<b>500</b>
Technical	20	125	180	500
Admin	25	77	100	270

**Alumni: 53 PhD, 31 MS, 35+60 MSc/MTech, 546+112 BTech**

Students = number on roll (number of programmes)

Technical = postdocs, project staff, permanent technical staff

Admin = permanent non-technical staff

Tentative  
numbers



# Degrees

- 4-yr BTech programmes:
  - Computer Science & Engg
  - Electrical Engg
  - Mechanical Engg
  - Civil Engg

Minors in many areas

  - Bioengineering?? Engineering physics??
- 2-yr MTech/MSc/MA programmes:
  - Energy Materials, Mech, Chemistry, Physics, Biotech, App. Maths, Power/Drives, VLSI, Structures, Development Studies
- MS (research) and PhD
  - Engineering, sciences and humanities





# Internationalisation

**Goal: 10% foreign faculty, 25% students**

- IIT Mandi led roadshows of 8 NextGen IITs to Bangladesh, Sri Lanka and Nepal in Mar-May 2018
  - ~ 200 applications for MSc/MTech/PhD, majority gave IIT Mandi as 1<sup>st</sup> preference
  - Several admission offers

# Gender Diversity

IIT Mandi led effort from 2016 to increase females in BTech in all IITs

**Goal: Increase 8% → 20%**

- In 2017: special outreach during JEE counseling  
==> 8% → 9.1%      **IIT Mandi: 4% → 15%**
- In 2018: 14% via supernumerary seats
  - Only candidates with ranks > IIT closing rank
  - **IIT Mandi target 20%**





# New Campus at Kamand

## Our Unique Advantage

- Strategy: Incrementally build-and-use
- Used from May 2012
- Currently, about 70,000 sqm complete
- All students and 95% faculty in the new residential campus
- 1,50,000 sqm under construction
  - Space for 2,500+ students, 200 faculty, plus staff by mid-2020



Indian  
Institute of  
Technology  
Mandi

Rigaku XRD  
Rs. 1.75 crores



NKN Electronic  
Classroom  
100 Mb/s Connectivity

Renovated Stable  
in Kamand, 2012





# Kamand Oct 2014

North campus

South campus

Kamand

Uhl River





# 2017: South Campus





# ... Some Achievements

- 100+ highly qualified faculty, mostly young
- *Nature Index 2017* (60+ science journals):
  - IIT Mandi ranked 5<sup>th</sup> among IITs  
(normalised by number of faculty)
- Sponsored R&D worth Rs. 70 crores
- 860 alumni in industry, academia, public sector – in India and globally
  - Pradeep Seervi: GATE(EE) topper, 2015
  - Aamir Khan: Civil Services 2nd rank, 2015
  - IITians Tech – 1st startup in 2014, several others since
- Strategic partnership with TU9, Germany
- Catalyst – technology-business incubator

# ISTP spinoff – EWOK

- Skills training, village-scale businesses by village women
- Using Internet and pervasive mobile network
- Serving local and global customers







# 2017: IIT Mandi Campus







2018: IIT Mandi = 1,040 (1,300) students,  
104 Faculty, 150 staff, 670 (860) alumni,  
Rs.70 crores Research Projects







# How you can contribute

- **Mentoring of students, projects, Catalyst, EWOK**
  - Guest lectures, 1-credit courses
- Hire our students
- **R&D projects sponsored by your company**
- Volunteer for our admission help desk
- **Donations**
  - One-time
  - Periodic: Rs. 100 every month, Rs. 1,000 every year
  - Earmark for specific purposes

**Any other suggestions???**



Scaling the heights



Capitalising on our unique locational advantage

A modest beginning on the arduous journey to making **Mandi a household name globally**

**We invite you to join in this exciting journey to build the future**

[www.iitmandi.ac.in](http://www.iitmandi.ac.in)