IC-IMPACTS
A Canadian Network of Centres of Excellence

Social Innovation through Canada-India University-Industry Partnerships

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IC-IMPACTS

› An International **Network of Centres of Excellence** funded equally by Governments of **Canada** and **India**

› The UBC-hosted **pan-Canadian, pan-Indian** Centre serves as a new model for international collaboration

› Total current **funding:** **$60 million**
Our Network

FACULTY  STUDENTS  INDUSTRY  COMMUNITY
Core Research Areas

Safe & Sustainable Infrastructure
- Low-Carbon Materials
- Sensors
- Strengthening

Integrated Water Management
- Sensors
- Alternative Power Supplies
- Water Treatment Systems

Public Health
- Rapid Diagnostic Devices and Lab-on-chip Sensors
- Infectious and Waterborne Diseases
- Mobile Health Technologies
Integrated Water Management

- **3D printed pH and chlorine sensors** for water
- **Off-grid water treatment with zero energy**
- **ICT platform** for water quality monitoring
- **Optical sensors** for *E. coli* in water
Public Health

- **Diagnostics** for emerging viral diseases such as Dengue and West Nile virus
- Engaging pharmacists to enhance *early detection of tuberculosis*
- Improving **child immunisation** services in India
- Developing **portable diagnostic** tools for detection of infectious diseases such as HIV and malaria
Examples of Translating Research into Communities (Safe & Sustainable Infrastructure)

- **Self Healing Road, Thondebhavi**
- **KRS Dam, Mysore**
- **STF (Scrap Tire Fiber) Repair, UBC**
- **Seismic Retrofit**
- **GFRP Wraps on Bridge Columns, Toronto**
Thondebhavi Self-Healing Concrete Rural Pavement Project

- India needs **2.4 million km of rural pavement**, this project saw the successful installment of self-healing road in Thondebhavi, India

- Reduce road thickness by 50% using high strength concrete with advanced **nano-modified hydrophilic fiber** system.

- Reduce **carbon footprint** by incorporating 50% flyash in concrete
Restoring KRS Dam, Mysore, India

Krishnaraj Sagar Dam, Mysore
Built 1924 Across River Kaveri
3.5 km long 38 m high
Total Capacity 49 Billion ft³

- Collaborative project between U of Alberta, Archaeological Society of India and National Institute of Engineering, Mysore
- Novel Nanolime Material for Repair
Bridge Monitoring in Nagpur, India

Ensuring a Safe Bridge with Minimal Maintenance for 100 Years
Fiber Reinforced Concrete: Eco-friendly Ductile Cementitious Composite (EDCC)

Quasi-Static $\dot{\varepsilon}$ Response

$$x = 2 \left( \frac{V_m}{Y_f} \right) \left( \frac{\sigma_{fui}}{\tau_{fii}} \right) \left( \frac{d_f}{4} \right)$$

Jamieson Elementary School, Vancouver Retrofitted in 2017

Girls School, Roorkee, India, 2018
Monitoring 2.1 Million Kilometers of Oil and Gas Pipelines for Leak Detection

Smart Cement-Based Patches

Smart Patch with Carbon Nanotubes for CRACK and LEAK Detection
IC-IMPACTS Future and An Invitation

Continued Research and Innovation for Community Transformation

Creation of Global Entrepreneurs and Companies

Expansion to other countries: US, Mexico and China
Thank you!

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