

**ICDP POST-OPERATIONS INTERNATIONAL WORKSHOP ON  
“Scientific Deep Drilling in Koyna, India”**

**Workshop Schedule**

Dates: October 14-16, 2017

Venue: Sayaji Hotel, Pune

**THEMES**

1. Reservoir Triggered Seismicity in Koyna vis-à-vis Global Scenario: Key Lessons
2. Review of Pilot Borehole Operations and Associated Studies
3. Design of Deep Borehole Observatory
4. Key Knowledge Gaps: Areas for Further Work
5. Field Visit to BGRL-MoES, Karad (Core Repository)

**ICE-BREAKER: October 13, 2017** 19:00 Barbeque Nation (Sayaji Hotel, 10<sup>th</sup> floor)

**DAY-1 (14 October 2017)**

**Session-1 09:30-13:00**

**INAUGURATION**

**Chairs: M Rajeevan (Shailesh Nayak) and Axel Liebscher**

09:30	Welcome	M Ravichandran (Rahul Mohan)
09:35	Background	Harsh Gupta
09:45	ICDP and Koyna	Ulrich Harms
10:00	Need for Scientific Drilling in India	Shailesh Nayak
10:15	Koyna – A Lighthouse in ICDP’s Project Portfolio	Axel Liebscher
10:25	MoES Vision on Koyna	M Rajeevan (BK Bansal)

Tea Break

11:00	Reservoir Triggered Seismicity in Koyna: Studies leading to Pilot Borehole	Harsh Gupta
11:30	A 3D subsurface density model and state of stress in the Koyna-Warna seismicity region	V M Tiwari
11:50	Deep borehole stability vis-à-vis strength and elastic properties of rocks around Koyna reservoir	Pradeep K Singh
12:10	Scientific Drilling of 3000m deep pilot borehole in Koyna region: Key achievements	Sukanta Roy

Working Lunch 13:00-14:00

**Session-2 14:00 – 16:00****PILOT BOREHOLE OPERATIONS AND ASSOCIATED STUDIES****Chairs: Marco Bohnhoff & N. K. Verma**

14:00	Challenges during drilling of the 3 km - deep pilot borehole	<u>R.B. Chakraborty</u> , Vyasulu Akkiraju
14:15	Geology of the pilot borehole and deformation features in the granitic basement	<u>Surajit Misra</u> , V. Bartakke, D. Vyas, A. Warhade, D. Nikalje
14:30	3D conductivity imaging below Koyna	P. Patro, <u>Ujjal Borah</u> , Kashi Raju, K. Chinna Reddy, Narendra Babu
14:45	Online Gas Monitoring during drilling of the Koyna pilot borehole	<u>Thomas Wiersberg</u> , P Nagaraju and Satrughna Mishra
15:00	Physical and mechanical properties of Deccan basalt and underlying basement rocks from downhole geophysical measurements	<u>Deepjyoti Goswami</u> and Vyasulu Akkiraju
15:15	State of stress in Koyna region inferred from hydrofrac tests and downhole logs	<u>Vyasulu Akkiraju</u> , Deepjyoti Goswami, Gerd Klee
15:30	Observations on hydrologic regime from drilling records and downhole measurements	<u>Nagaraju Podugu</u> and Satrughna Mishra
15:45	First investigation on the microbial inventory of deep continental crust sampled through Koyna 3000 meter pilot borehole	<u>Pinaki Sar</u> and Sufia K. Kazy

Tea Break

**Session-3 16:30-18:40****GLOBAL TRENDS****Chairs: Domenico Giardini and Brijesh Bansal**

16:30	In-situ Pore Pressure Variations in Koyna-Warna region: A Promising Key to Understand Triggered Earthquakes	<u>HJ Kuempel</u> , RK Chadha, DV Ramana & M Ravi
16:50	Downhole seismic instrumentation: Benefits for detecting and locating microseismicity	<u>Marco Bohnhoff</u>
17:10	Scientific Exploration of Induced Seismicity and Stress	<u>William Ellsworth</u>
17:30	Drilling target: Oklahoma Induced Seismicity	<u>Ze'ev Reches</u>
17:50	Fault stimulation and circulation experiments in deep tunnels under the Alps	<u>Domenico Giardini</u>
18:05	Drilling Seismogenic zones in deep South African gold mines (DSEIS), South Africa	<u>Hiroshi Ogasawara</u>
18:25	Recent developments in fibre-optical sensing	<u>Ernst Huenges</u>

Dinner 20:00 Pool-side "Turque" Restaurant Sayaji Hotel

----- END OF DAY-1 -----

**DAY-2 (15 October 2017)**

**Coordinators: Vyasulu Akkiraju & Sukanta Roy**

Field Visit to BGRL Core Repository  
*at*  
Borehole Geophysics Research Laboratory (BGRL)  
Ministry of Earth Sciences, Karad

Assemble at Ground Floor Reception / Lobby at Sayaji Hotel, Pune	07:00
Departure for Karad by bus	07:15
Arrival at BGRL office	10:15
Tea	10:30
Brief Introduction to BGRL (Rahul Mohan)	11:00
LUNCH at Karad (Hotel Pankaj)	12:15
Departure for BGRL Core Repository and Facilities	13:15
Arrival at BGRL Campus (under development)	13:30
Display of core samples from Koyna region	14:00
Discussions over tea	
Departure for Pune	17:00
Arrival at Hotel Sayaji, Pune	20:00
DINNER at "The Portico" (Sayaji Hotel)	20:30

----- END OF DAY-2 -----

### DAY-3 (16 October 2017)

#### Session-4

#### FUTURE PLANS / INPUTS

**Chairs: Ulrich Harms & Virendra M Tiwari**

09:30	Plans for Deep Borehole Observatory	Sukanta Roy
09:50	Inputs from experts; Discussion	OPEN
10:35	Introduction to Break-out group sessions	B.K. Bansal
10:45	Tea Break	
11:00	Parallel break-out group meetings (3 rooms)	Sapphire Hall: Breakout 1 Emerald 1: Breakout 2 Emerald 2: Breakout 3

Break-out Group -1: Downhole Instrumentation (Lead: Marco Bohnhoff & David Chapman)

Break-out Group -2: Downhole Geophysics, Stress and Thermal Regime

(Lead: Francois Cornet, Amalendu Sinha & Deepjyoti Goswami)

Break-out Group -3: Fault zone studies (Lead: Ze'ev Reches, Prabhas Pande)

Working Lunch            13:00-14:00

**Chairs: Harsh Gupta & William Ellsworth**

14:00	Recommendations of Break-out Group -1	Marco Bohnhoff & David Chapman
14:20	Recommendations of Break-out Group -2	Francois Cornet, Amalendu Sinha & Deepjyoti Goswami
14:40	Recommendations of Break-out Group -3	Ze'ev Reches & Prabhas Pande
15:20	Suggestions / Inputs	OPEN
16:20	Final recommendations	Harsh Gupta & William Ellsworth
16:30	Vote of thanks	Sukanta Roy

High tea

----- CLOSE OF WORKSHOP -----

DEPARTURES

DINNER at "The Portico" (Sayaji Hotel)

19:30