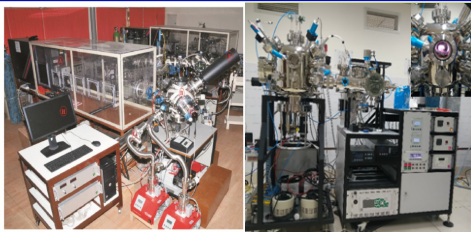


Short Term Course
on
**“Thin Films Growth: Fundamentals
and real time growth demonstration”**
18- 20 December, 2018



Organized by
Quantum Resistance Metrology and 2D Physics Group
CSIR-National Physical Laboratory, New Delhi-110012
www.nplindia.org



Objective of the Course:

Quantum Resistance Metrology and 2D (two dimensional) Physics Group, CSIR National Physical Laboratory is conducting three day Short Term Course on "Thin Films Growth: Fundamentals and real time growth demonstration" during 18-20 Dec, 2018 at CSIR-NPL, New Delhi. The main emphasis of the course will be on the basics and theory of thin film growth, large area multi-layer growth, homo/hetero epitaxy and 2D materials growth. This program is an initiative to expose the young researchers working in the field of thin film growth. This will provide a unique experience of real time demonstration of various thin film growth techniques namely Pulsed Laser Deposition, Molecular Beam Epitaxy, Laser MBE, RF/DC Magnetron Sputtering, Thermal and e-beam Evaporation.

The course will be conducted by scientists working in the area of thin film and 2D materials growth. In the forenoon, participants will be introduced to the fundamentals of thin film growth and deposition processes. Real time thin film growth demonstration will be performed in the afternoon.

Masters, Ph.D., young faculties and industry personnel are encouraged to apply.

Certificate: Certificate will be issued to the participants by CSIR-NPL on the completion of the course.

Course Content:

- ✓ Basics of thin film growth
- ✓ Nucleation and growth theory
- ✓ Epitaxial growth process
- ✓ Molecular Beam Epitaxy for growth of semiconductors
- ✓ Laser MBE of III-V semiconductors
- ✓ PLD for growth of oxide 2DEGs
- ✓ 2D materials and their growth
- ✓ RF and DC Magnetron sputtering
- ✓ Metal contacts deposition using electron-beam evaporator
- ✓ Thermal evaporation for metal coatings
- ✓ Real time growth demonstration of MBE/ Laser MBE, PLD, RF/DC Sputtering, Thermal and e-beam Evaporation processes.

Registration Details:

Please fill the online Registration Form available on our website or send the same through email. Approved participants after intimation need to send the scanned copy of completed Registration Form along with the fees details to the email:

qhr2dphys.npl@gmail.com.

Course Fee: Rs.5,000/- (including GST) includes registration kit, breakfast and lunch. The fees can be paid online (details given below) or by demand draft in favor of "Director NPL."

Accommodation: Limited on payment basis

Important Dates:

Deadline for submitting application: 25/11/ 2018

Intimation Regarding Acceptance: 05/12/2018

Online Payment Details:

Bank Account Details:

Name: Director NPL

Name of the Bank: Syndicate Bank

Bank Branch & Address: National Physical Laboratory, Pusa Campus, New Delhi-110012

Bank A/c No.: 91002010030018

Account Type: Saving

MICR Code: 110025087

IFSC Code: SYNB0009100

Reference: TFG_Dec2018

Email ID: ghr2dphys.npl@gmail.com

The participants should provide the following details regarding online payment:

1. Name of the person depositing the Fee
2. Transaction No.
3. Date of Transaction
4. Amount
5. Bank & Branch Name

Please visit www.nplindia.org website for the details.

Coordinators

Dr. H. K. Singh

Dr. Sunil Singh Kushvaha

Co-ordinators

Dr. Suraj P. Khanna

Dr. Anjana Dogra

Organizing Committee

Dr. Prabir Pal

Dr. Ajay K. Shukla

Dr. P. K. Siwach

Contact/Address to send DD:

Dr. H. K. Singh

Pr. Scientist & Head

Quantum Resistance Metrology and 2D Physics Group

Room No. 39, Main Building,

CSIR-National Physical Laboratory,

Dr. K. S. Krishnan Road,

New Delhi-110012

Phone (Office): 011-45608605/8604/9329

hks65@nplindia.org

ghr2dphys.npl@gmail.com

For online Registration please visit

<https://goo.gl/forms/7frl1WunZhkZZ6Ze2>



REGISTRATION FORM Short Term Course On



“Thin Films Growth: Fundamentals and real time growth demonstration” 18- 20 December, 2018

Name :
(In capital letters)

Designation :

Department :

Organization :

Address :

Contact No :

Email :

Accommodation Required: (Yes/No)

Signature of the Participant :

The applicant is hereby permitted to attend the short-term course, if selected

Signature and Seal of the Competent Authority