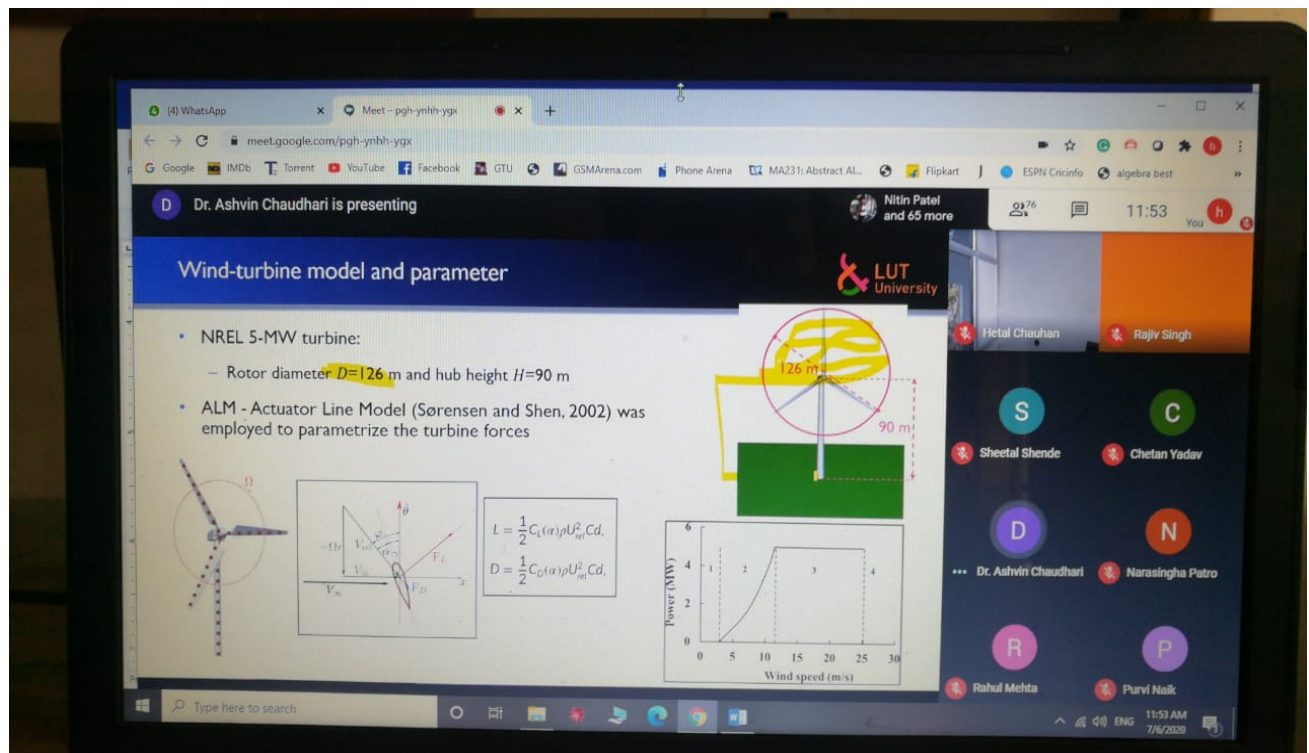


FDP on Mathematical Aspects of Fluid Dynamics

Applied Sciences and Humanities Department has organized one week National level Faculty Development Program on “**Mathematical Aspects of Fluid Dynamics**” during 6th July to 11th July 2020. Approximately 236 faculties from all over India have participated in the Faculty Development Program. Dr. Ashvin Chaudhari, Dr. Pavitra, Dr. Twinkle Singh, Dr. N. B. Desai and Dr. Akhil Mittal gave their session in the program. Different aspect of wind flow, fluid flow were discuss in the program by the experts.



The screenshot shows a Google Meet interface with a presentation titled "Wind-turbine model and parameter" by Dr. Ashvin Chaudhari. The presentation content includes:

- NREL 5-MW turbine:
 - Rotor diameter $D=126$ m and hub height $H=90$ m
- ALM - Actuator Line Model (Sørensen and Shen, 2002) was employed to parametrize the turbine forces

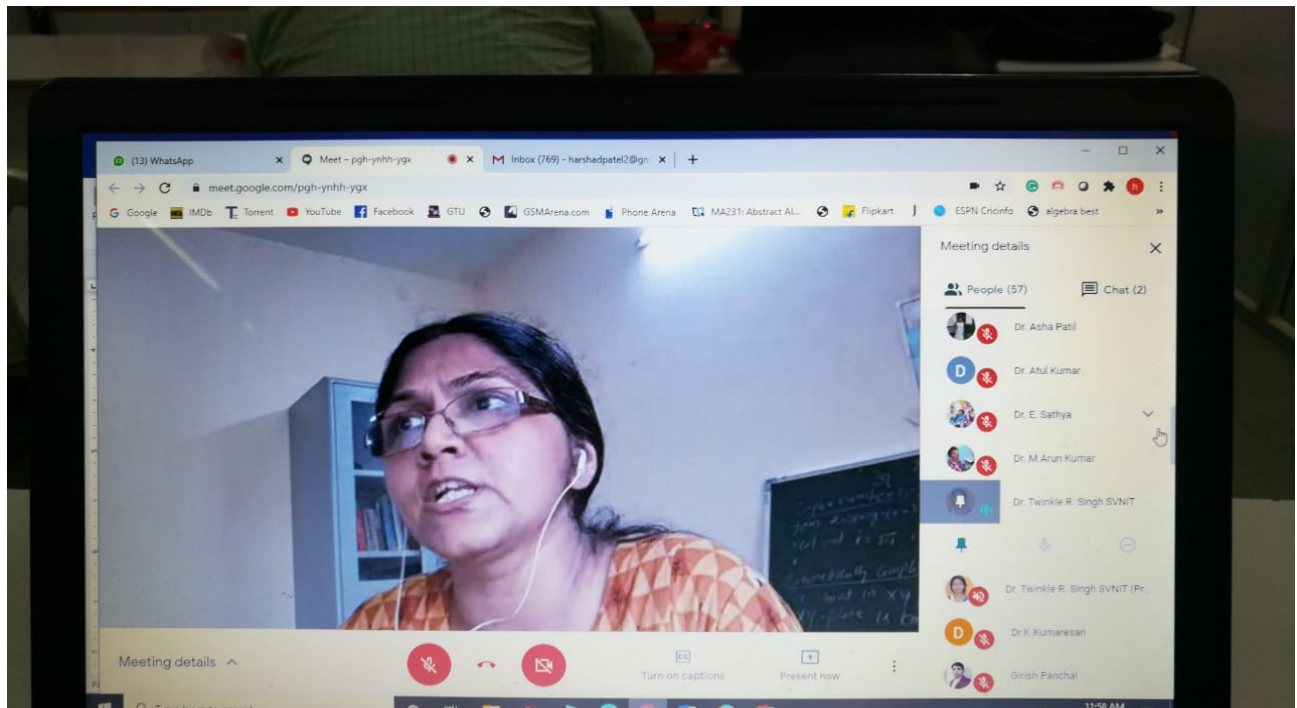
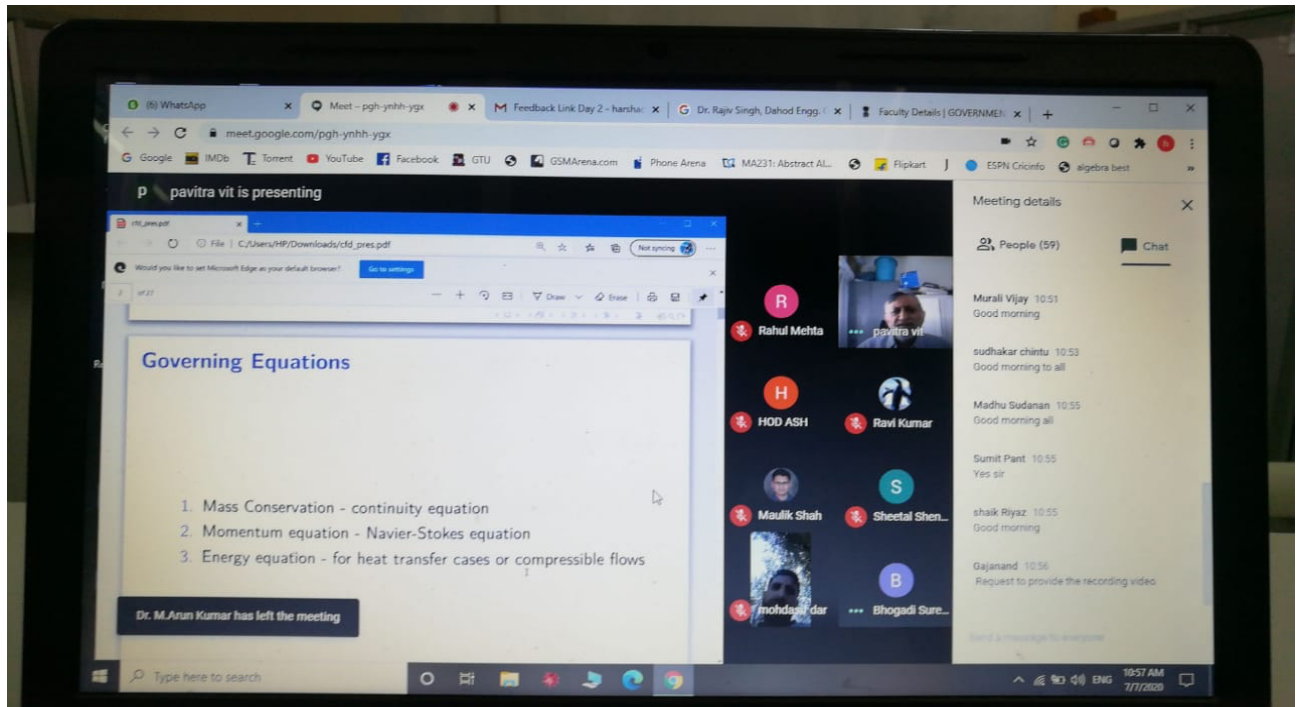
Diagrams and equations shown in the presentation include:

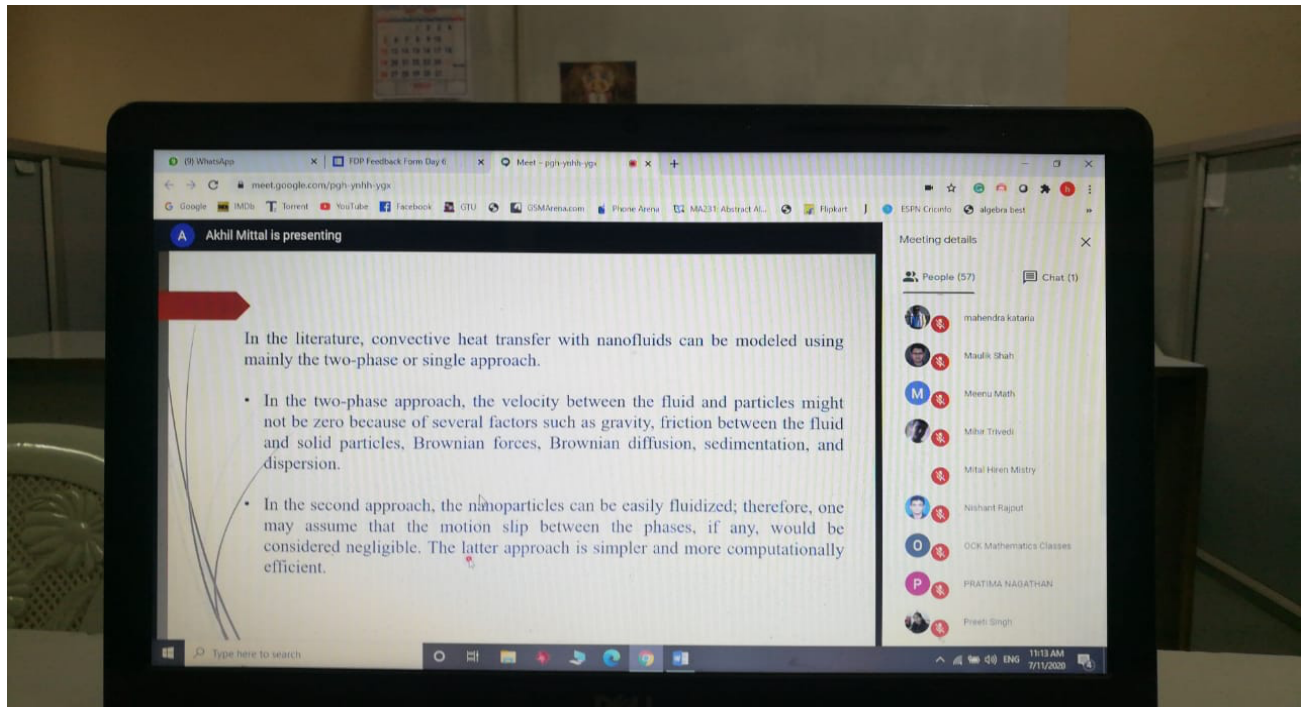
- A diagram of a wind turbine with rotor diameter $D=126$ m and hub height $H=90$ m.
- A diagram showing the coordinate system for the actuator line model with velocity components V_{∞} , V_{θ} , V_{ϕ} , and forces F_L , F_D .
- Equations for lift and drag forces:

$$L = \frac{1}{2} C_L(\alpha) \rho U_{rel}^2 C_d$$

$$D = \frac{1}{2} C_D(\alpha) \rho U_{rel}^2 C_d$$
- A power curve graph showing Power (MW) vs Wind speed (m/s) with regions 1, 2, 3, and 4.

The Meet interface shows participants: Nitin Patel and 65 more, and a list of participants on the right including Hetal Chauhan, Rajiv Singh, Sheetal Shende, Chetan Yadav, Dr. Ashvin Chaudhari, Narasimha Patro, Rahul Mehta, and Purni Naik.





In the literature, convective heat transfer with nanofluids can be modeled using mainly the two-phase or single approach.

- In the two-phase approach, the velocity between the fluid and particles might not be zero because of several factors such as gravity, friction between the fluid and solid particles, Brownian forces, Brownian diffusion, sedimentation, and dispersion.
- In the second approach, the nanoparticles can be easily fluidized; therefore, one may assume that the motion slip between the phases, if any, would be considered negligible. The latter approach is simpler and more computationally efficient.