

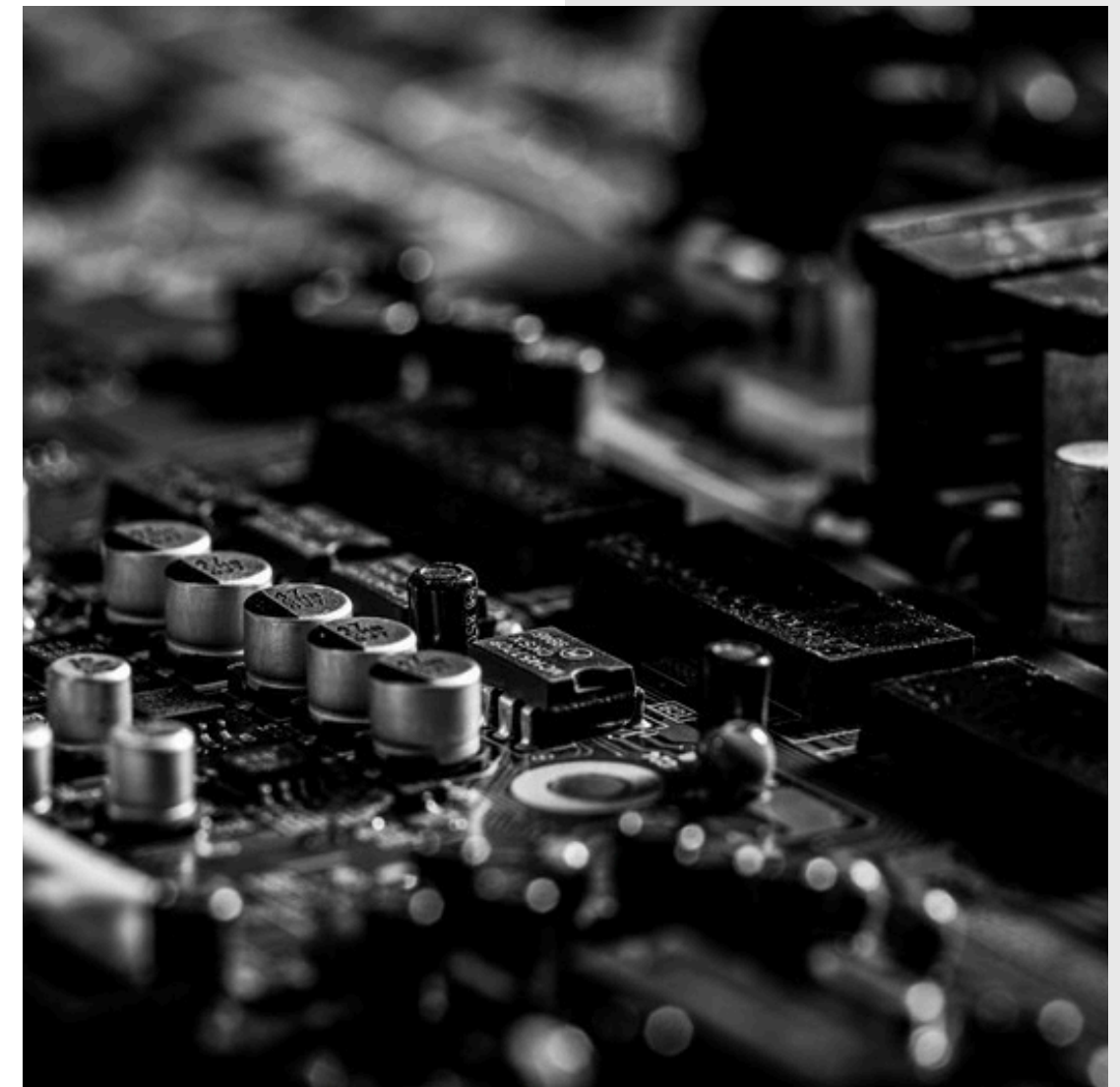
PERSONNEL BEHAVIOUR ERROR

HOCHSCHULE HARZ



**MIGUEL ÁNGEL FLORES CALVILLO
JORGE EDUARDO VAZQUEZ OLMOS
LEONARDO FLORES MONTAÑO**

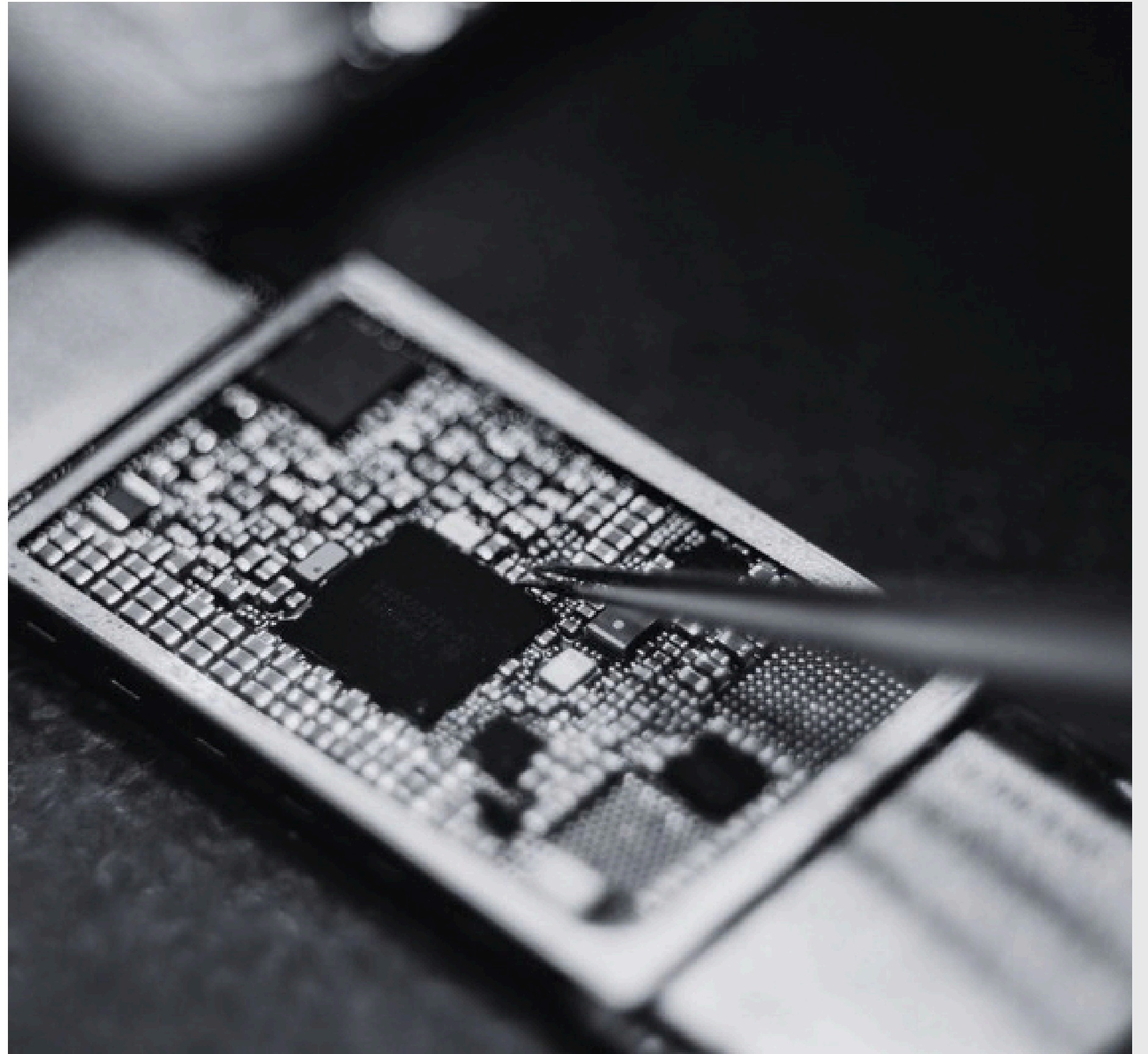
CLEANROOM 4.0
PROFESSOR: DR. RENÉ SCHENKENDORF

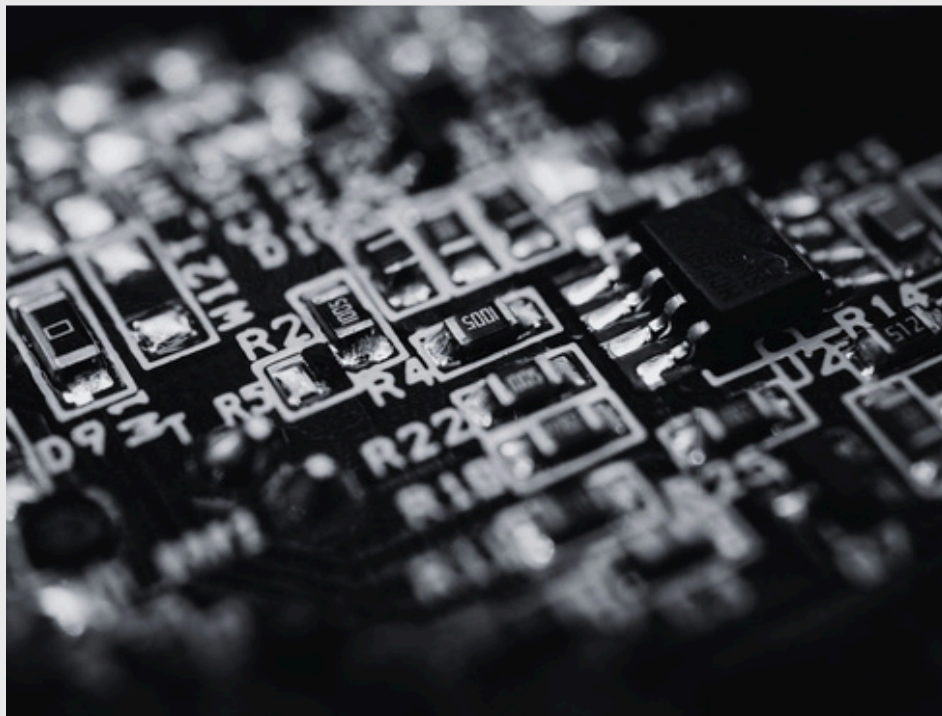
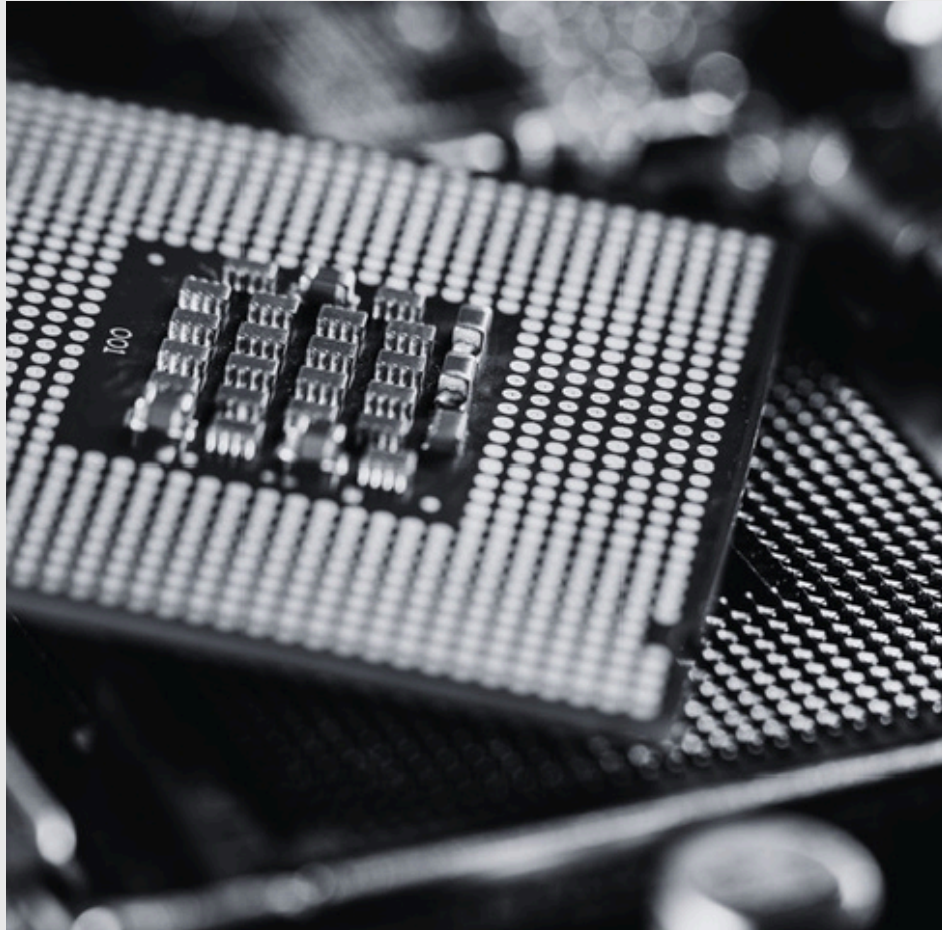


HOW DOES THE ERROR LEAD TO CONTAMINATION?

- Personnel are one of the main sources of contamination in a cleanroom.
- Incorrect gowning, touching clean surfaces, or unnecessary movement can release particles, skin flakes, microorganisms, and fibers.
- These contaminants can enter the cleanroom air and settle on equipment, products, or surfaces.
- This creates a contamination chain:

Human error → contaminant release → airborne/surface contamination → product contamination





WHAT EFFECTS DOES THIS HAVE ON CLEANROOM OPERATION?

- Increased particle and microbial contamination.
- Possible product defects or contamination.
- Production may need to be stopped for investigation and cleaning.
- More cleaning, disinfection, and monitoring are required.
- In regulated industries such as pharmaceuticals or medical devices, contamination can lead to batch rejection and financial losses.



WHAT MEASURES CAN PREVENT THIS?

- Proper cleanroom training and regular refresher training.
- Strict gowning procedures and hygiene rules.
- Minimize unnecessary movement and talking.
- Follow correct material and personnel flow.
- Use airlocks and controlled access.
- Regular environmental monitoring for particles and microorganisms.
- Clear procedures and supervision to ensure personnel follow the rules.



CONCLUSION

Personnel behaviour plays a critical role in cleanroom contamination. Even a small error, such as incorrect gowning or unnecessary movement, can start a contamination chain and affect product quality and production.

Therefore, proper training, strict procedures, good hygiene, and continuous monitoring are essential to maintain cleanroom conditions and prevent contamination.





MIGUEL ÁNGEL FLORES CALVILLO
JORGE EDUARDO VAZUQUEZ OLMOS
LEONARDO FLORES MONTAÑO



THANK YOU

