# What is Static Electricity?

- Static Electricity is a latent electrical charge associated with a dielectric mass (non-conductor) or a conductive mass (such as metal) which is not properly grounded.

- Static Electricity becomes dynamic when it finds a difference in static potential or a conductive path to ground.

- Static Electricity is usually caused by air movement or friction, this is called triboelectric charging.

- It occurs naturally in the environment and we can see evidence of it in the form of lightening, or that small electrical shock that occurs when you walk across a carpet and touch a doorknob. This is **Electrostatic Discharge or ESD**. And even though the doorknob was probably not grounded, its static potential was different than yours, hence the shock.

# Why is Static Electricity Bad?

- **ESD** can damage the microcircuitry of wafers and reticles. Sometimes not completely, so the device does not immediately fail, but the damage is there and the device will probably fail prematurely.

- **ESD** events also cause **Electromagnetic Interference, or EMI**, which can be disruptive to microprocessors. This can cause tool crashes or lockups.

- Static Electricity also attracts **particles**, as evidenced by the dust on your TV screen or computer monitor. This is referred to **Electrostatic Particle Attractions or ESA.**

- Balanced Ionization can virtually eliminate ESD, EMI and ESA.

# Air Ions

- Ions are electrically charged molecules, either positive or negative, which occur naturally in our environment. They are usually kept in balance with the positives canceling the negatives, and vice versa.

- In a controlled environment, such as a cleanroom, air ions can become unbalanced.

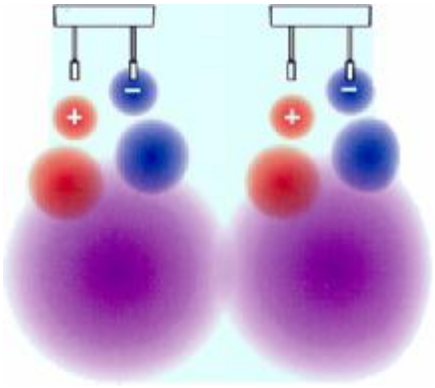
- Grounding furniture and tools helps, but not all can be grounded and those that are provide a path to ground for ESD events.

- Dielectric objects such as reticles, wafer cassettes and other non-metallic items cannot be effectively grounded.

- Introducing air ions throughout the cleanroom environment neutralizes latent static charges and eliminates differences in static potentials.

# How are Air Ions Introduced?

**Air Ionization** is the means of introducing positive and negative ions to an unbalanced environment.



*Corona Emission*

ION invisible problems visible results

Uses pulsed, steady-state DC, or alpha ion emission to generate ions. It is a balanced, low-current system that was first developed for domestic use to control dust and allergens, and has now proved itself effective for static control in major hi-tech facilities around the world.

*Ceiling Emitters*