The MTU Π-Chamber is a convection cloud chamber designed to study atmospheric clouds under a wide variety of temperatures and pressures. The internal volume of the Π-Chamber is 3.14m$^3$, which gives the Π-Chamber its name. The temperatures of the top, bottom, and sidewalls of the chamber are independently controlled, allowing us to create a turbulent environment through Rayleigh-Bénard convection. Because the chamber can form a cloud due to turbulent mixing, we are able to create and maintain a cloud for several hours.

### Aerosol-Cloud Interactions
- Soot compaction through cloud processing (Bhandari et al. 2019).

### Mixed Phase Clouds
- The role of aerosols in the glaciation of mixed phase clouds (Desai et al. 2019).
- Ice nucleation in the wake of falling hydrometeors (Prabhakaran et al. 2020).

### Aerosol Removal and Cloud Cleansing Through Activation
- Aerosol activation and cloud formation in a turbulent environment (Shawon et al. 2021, Prabhakaran et al. 2020).
- Aerosol removal and cloud collapse is accelerated by supersaturation fluctuations (Chandrakar et al. 2017)

### Cloud Optical Properties
- Optical blurring due to aerosols (Packard et al. 2018).
- Light scattering in a turbulent cloud (Packard et al. 2020).

### Humid Rayleigh-Bénard Convection
- Supersaturation fluctuations in moist Rayleigh-Bénard convection (Chandrakar et al. 2020).

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**Michigan Tech Π Convection Cloud Chamber**

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**Overview**

The MTU Π-Chamber is a convection cloud chamber designed to study atmospheric clouds under a wide variety of temperatures and pressures. The internal volume of the Π-Chamber is 3.14m$^3$, which gives the Π-Chamber its name. The temperatures of the top, bottom, and sidewalls of the chamber are independently controlled, allowing us to create a turbulent environment through Rayleigh-Bénard convection. Because the chamber can form a cloud due to turbulent mixing, we are able to create and maintain a cloud for several hours.

**Operating Conditions**

**Pressure:**
- 1.0 to 0.1 atmospheres

**Temperature:**
- -50 to 40 Celsius

**Rayleigh Number:**
- $\leq 2 \times 10^8$

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**Research Topics and Publications**

**Aerosol-Cloud Interactions**
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[https://phy.sites.mtu.edu/cloudchamber/nsf-cif/](https://phy.sites.mtu.edu/cloudchamber/nsf-cif/)

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