

# CREST HIRES Summer 2016 Research Project

BY:

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Research Group/Theme: Energy Efficiency in Buildings

# Energy Efficiency in NYC Municipal Buildings

- In New York City, buildings are responsible for nearly 75% of greenhouse gas emissions (GHGs)
- Increasing energy efficiency in buildings contributes to New York City's sustainability goal to reduce GHGs 80% by 2050

# Objectives and Goals

- Explore energy consumption and demand data in NYC municipal facilities
- Use change-point linear regression models of building energy data to identify and quantify heating, cooling and baseload energy consumption in commercial buildings (end-use breakdowns)
- Compare end-use breakdowns across different facility types to identify conditions that are suitable for different kinds of energy efficiency measures
- Work with electricity demand load profiles to investigate relationships between high demand loads and high baseloads identified in corresponding change-point models

# CIUS Building Performance Lab (BPL)

- BPL Energy Data Lab team
- Lab location – 101 W. 31<sup>st</sup> St., New York, NY 10001

# Methodology

- Students will be using:
  - Building energy datasets
    - Electricity, steam and natural gas consumption data (monthly)
    - Electricity demand data (15-minute interval)
  - Regression modeling
  - Data visualization
  - Data analysis
  - Optional: Python, Visual Basic

# Research Experience Benefits

- By the end of the summer research experience, students will understand:
  - How to approach datasets with the intention of producing actionable knowledge
  - The difference between building energy consumption and demand
  - How to model and visualize building energy data
  - When to apply various statistical metrics and functions