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Taming the plasma-material interface with the "snowflake" divertor

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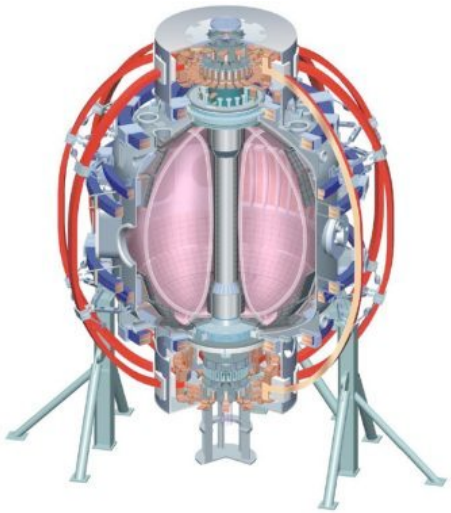

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Outline

- Motivation: PMI challenge
- “Snowflake” divertor configuration idea by D. D. Ryutov
  - Analytic theory and numerical modeling
- NSTX results in hand
  - Magnetic properties (area expansion, angles, SOL volume)
    - Actual NSTX equilibria and ISOLVER models
  - Magnetic control (SP control, X-point control with PCS)
  - Main results: divertor peak heat flux reduction, impurity reduction
  - Other results: pedestal stability, core confinement, divertor properties, compatibility with pumping scenarios, preliminary turbulence characteristics
- Results to be obtained
  - turbulence and blobs, heat flux scaling, SOL flows, impurity sources, ELM control, ion X-point loss
  - UEDGE modeling of radiation and edge/SOL transport
- Projections for future devices (NSTX-U, ST-CTF)