## High field magnets

Superconducting magnets:

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Nb-based superconductors have B_c up to ~ 25 T
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Highest-field superconducting magnets to date: 23.4 T

*Hybrid magnets:* 

Highest-field DC magnet: flux density 45 T in a 32 mm bore Power consumption: 30 MW (>100 l/s cooling water required)

Resistive magnets:

Short pulse (10–20 ms) non-destructive magnets: 70–80 T range Destructive pulsed magnets up to  $\sim$ 2800 T during several microseconds

## From: Supercond. Sci. Technol. 17 (2004) R19

## Hochfeldmagnet



Arrival of 45 T hybrid magnet cryostat at the National High Magnetic Field Laboratory, Florida State University, Tallahassee

## Hochfeldmagnet



Bitter disk for a 16 T magnet

40 cm diametre

I = 20 kA

F≈BI



Schematic of a Bitter magnet showing alternate conductors and insulators (shaded). The adjacent conducting disks make contact in a region of overlap.