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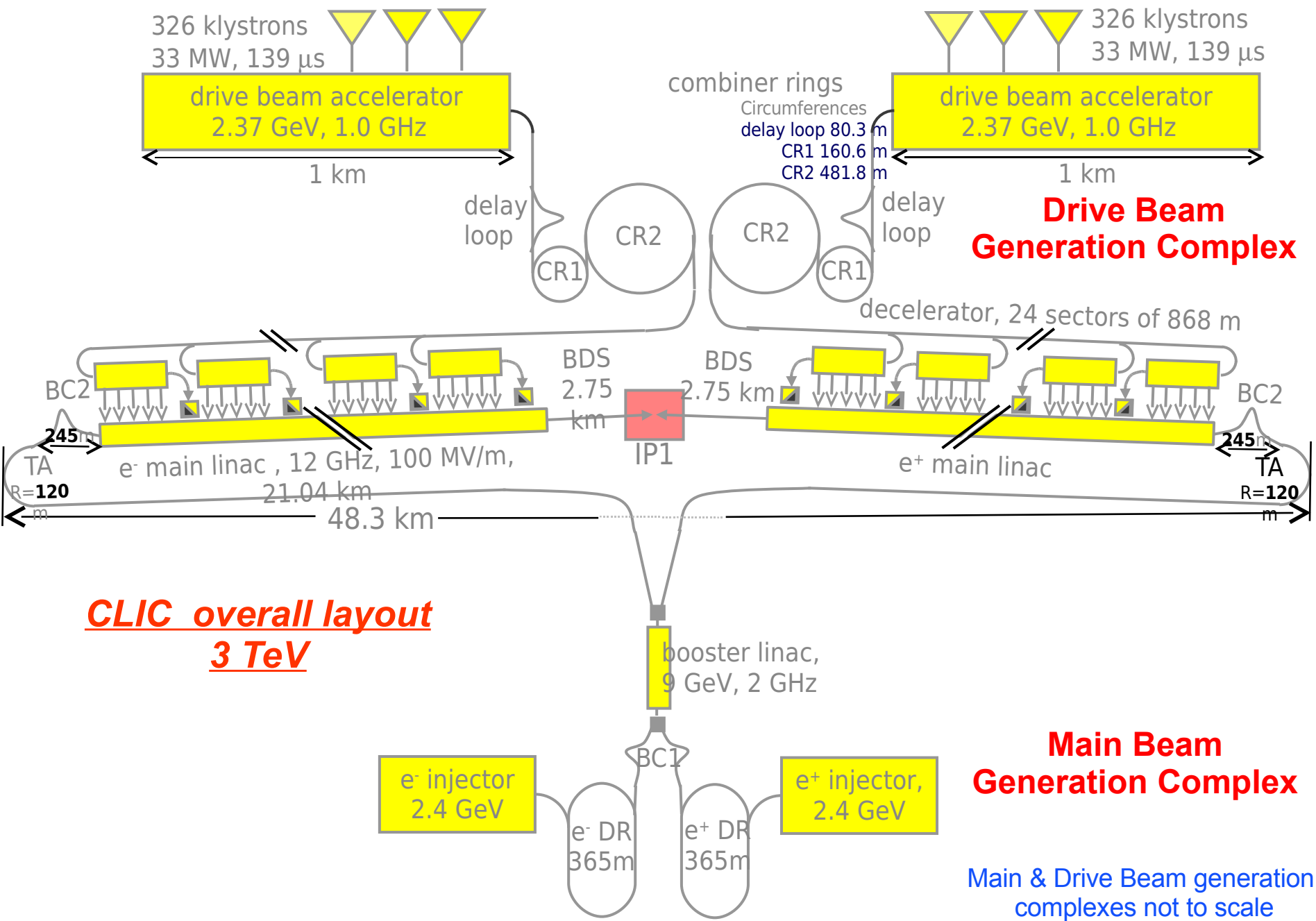
CLIC

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Why?

- LHC probes high energies (7+7 TeV)
 - Proton-proton collisions
 - Many participating quarks and gluons
 - Events are very complex and difficult to analyze
- CLIC probes parton energies (1.5+1.5 TeV)
 - Electron-positron collisions
 - Point-like particles
 - Reasonably well-defined initial-state energies
 - Precision measurements that are easier to interpret





CLIC Overview

- **Main beam**
 - Particles sources
 - Damping rings
 - RTML
 - Main linac
 - Beam-delivery system
 - Interaction point
 - **Post-collision line**
- **Drive beam**
 - Particle sources
 - Linac (low E, high I)
 - Delay loop and combiner rings
 - Long beamline
 - Decelerators with power extraction structures



Many critical issues

- DB: Beam interleaving in delay loop and combiner rings to get right time structure and high beam current
- DB: Drive beam stability in decelerator
- MB: Reaching high energies, reliably and economically!
- MB: High luminosity: Making small spots with nm size, alignment and jitter tolerances
- ***MB: Beam quality preservation in linac***
- ***MB: Post-collision line***
- ***DB+MB: Two-beam acceleration scheme***

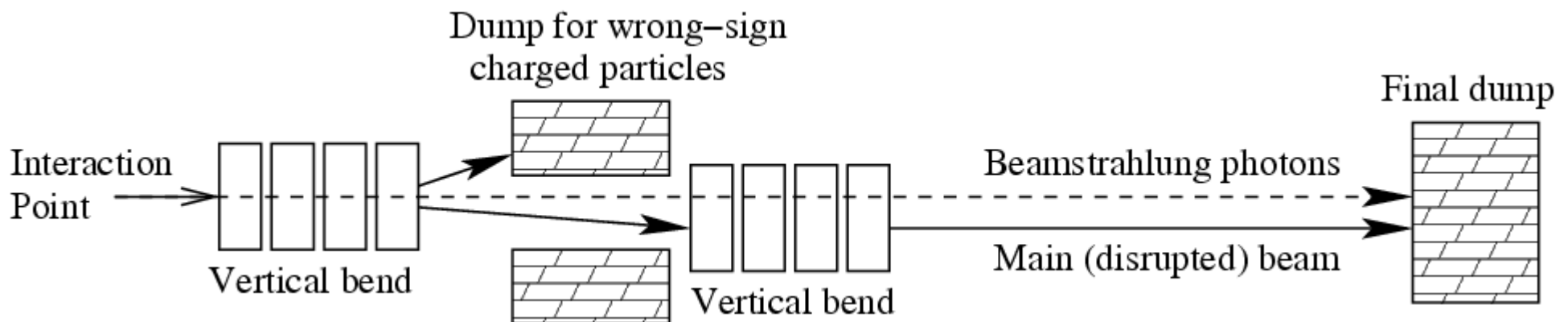
→ Test-facility CTF3 at CERN



Beam-quality and Post-collision

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- Peder Eliasson's (CERN-UU) thesis
 - Beam alignment and correction algorithms for Linacs
- FP6-EuroTeV project on the conceptual design of the multi-TeV post-collision line (A. Ferrari, VZ)
 - Safely dispose 14 MW beam power when in collision (large energy spread) or not (small beam on dump)



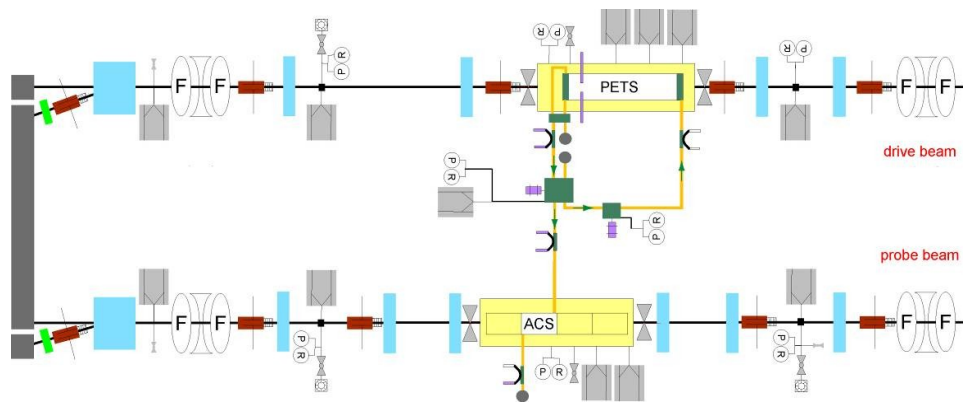
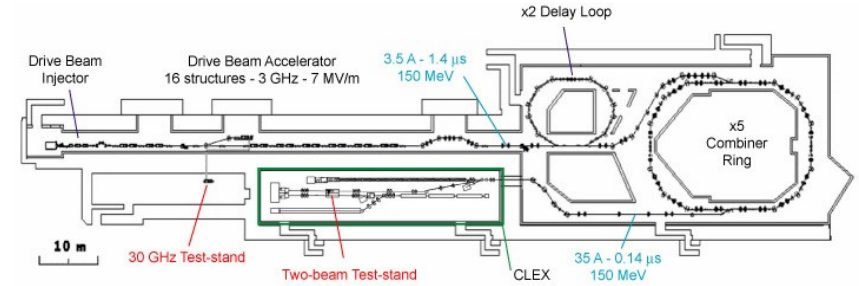
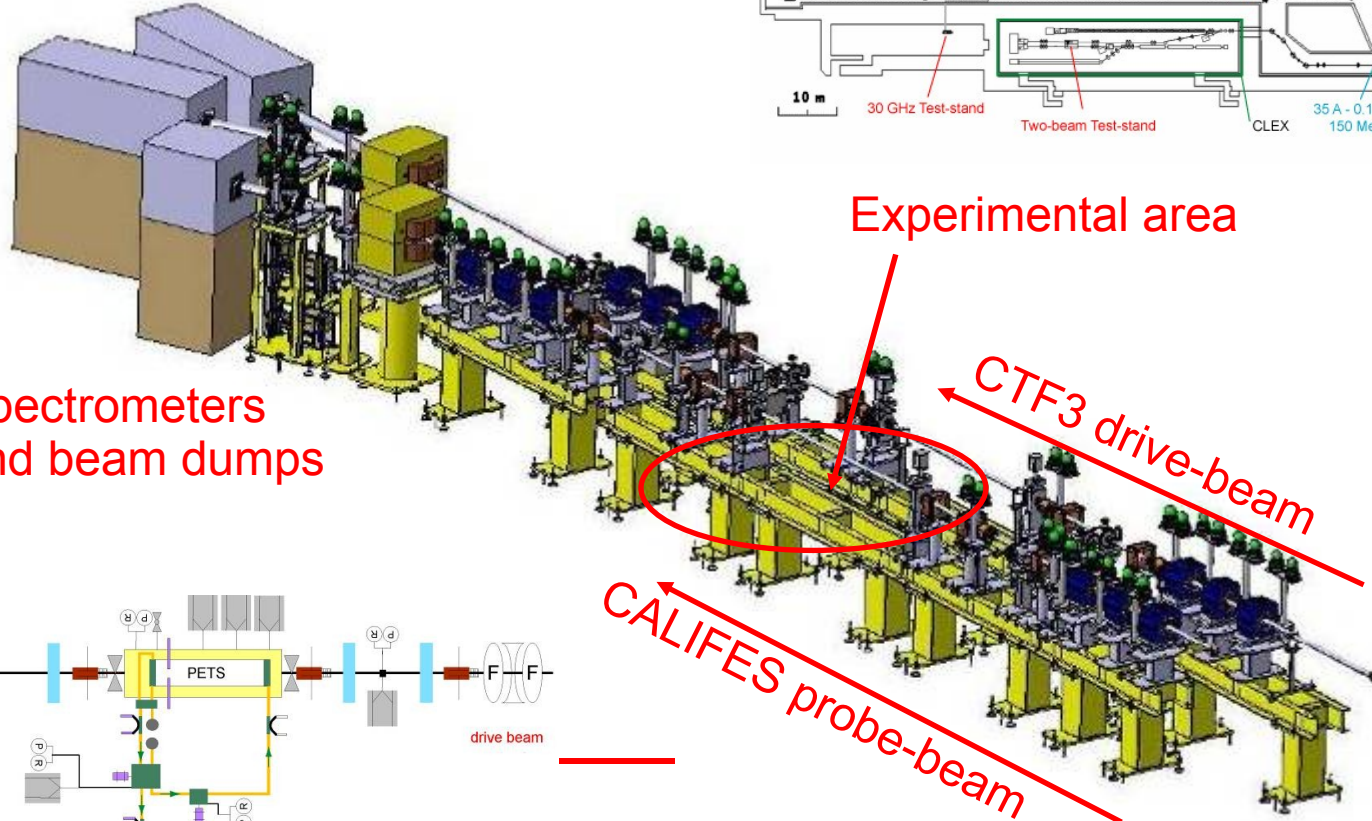


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Two-beam Test-stand in CTF3

TBTS crew:

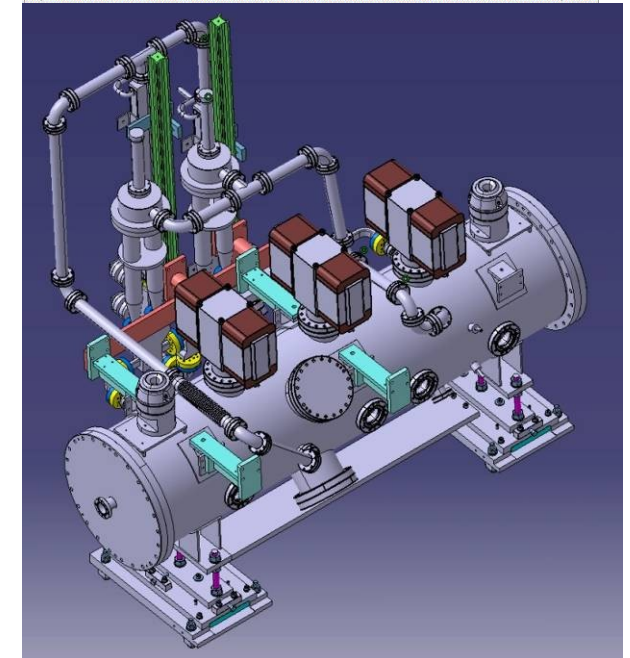
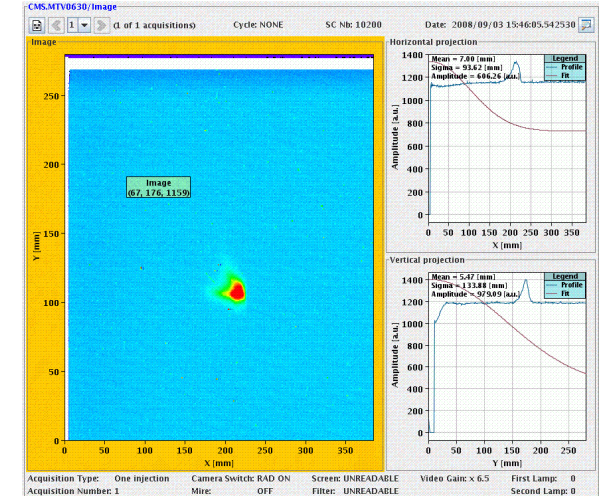
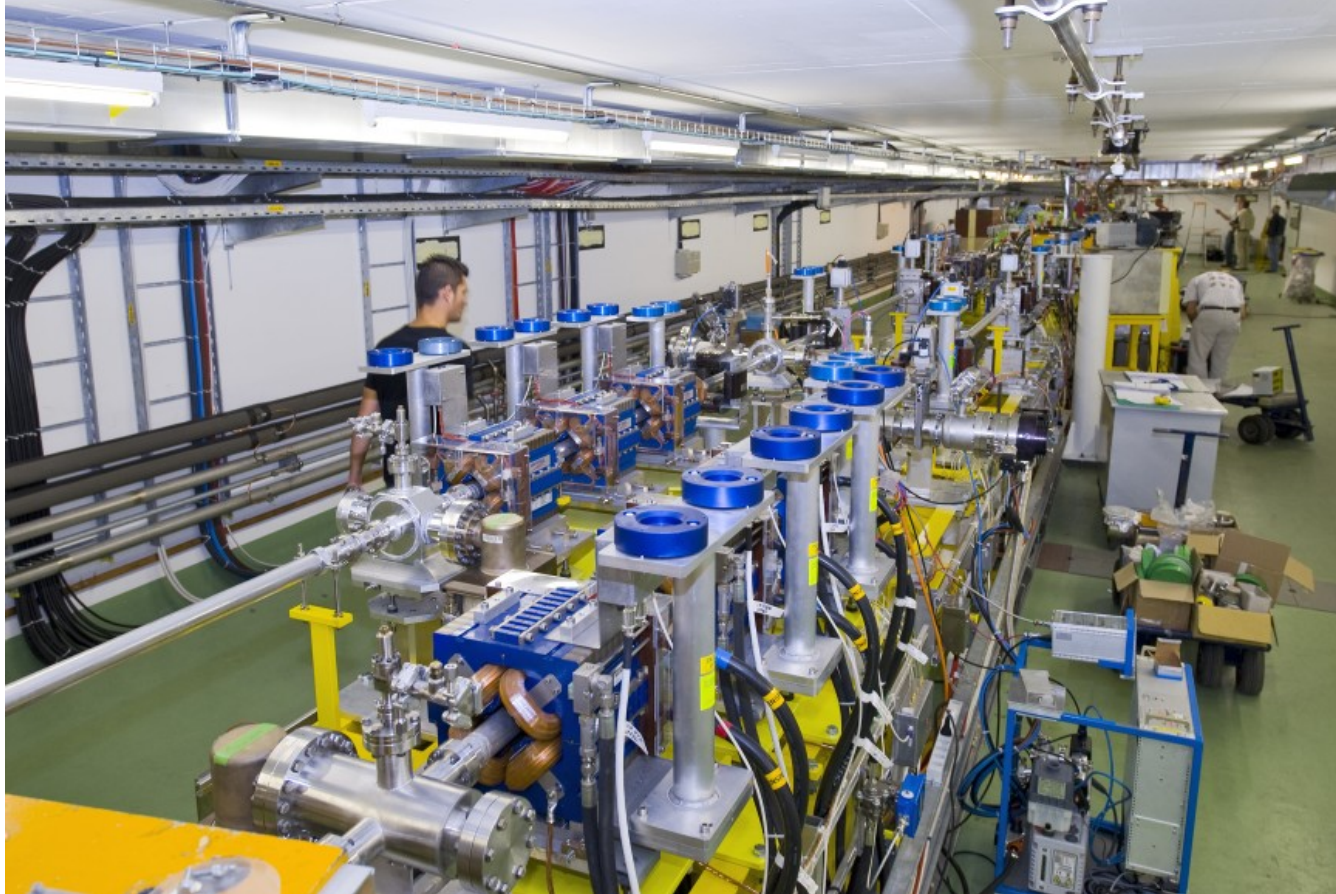
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TBTS, the real thing



Installation of beam line is complete, first beam arrived at the dump screen on Sept 3, PETS tests imminent.



Summary and Future

- Wide program around the accelerator physics issues of CLIC
 - Beam-quality and post-collision \checkmark
 - Mostly focused on the two-beam test-stand
 - Beam based diagnostics of RF-breakdown (lic MJ)
- Will participate in FP7 EuCARD project
 - TBTS upgrade and breakdown test inside SEM
- Started collaboration on Nordic scale
 - UU, U-Oslo, U-Helsinki → ***NorduCLIC***
- ***Doctoral student position available, now!***