RadiaBeam Technologies Products and Capabilities

Marcos Ruelas

Who We Are

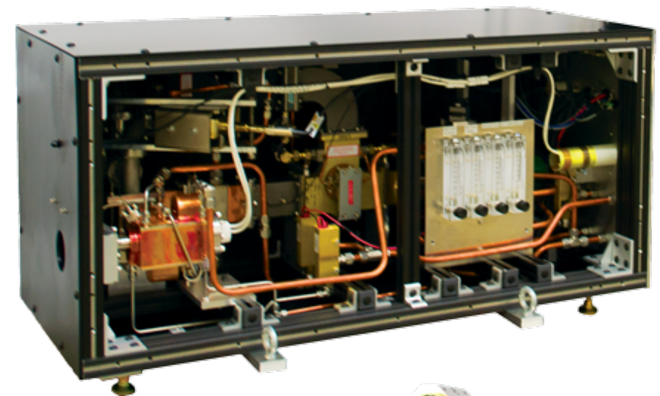
- Spun-off from the UCLA Particle Beam Physics Laboratory in 2004
- ~50 employees, including 9 PhD scientists and 22 engineers
- Strong accelerator physics and engineering backgrounds
- Worldwide sales, service, software, and consulting with a strong R&D program
- Offices in
  - Headquarters, Los Angles
  - Sales, San Francisco bay area
  - European office, Italy

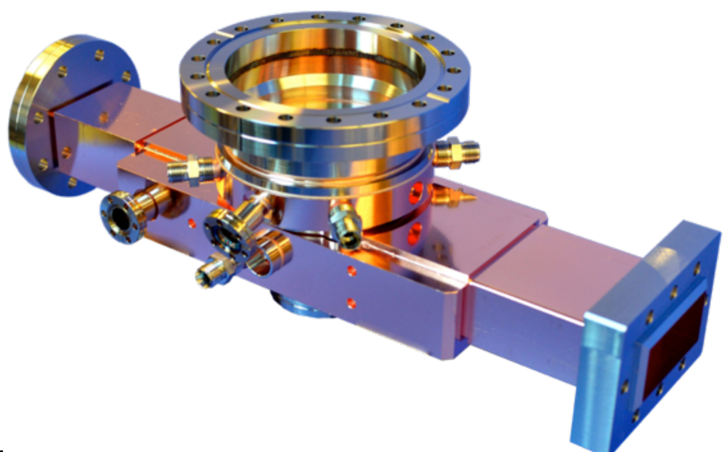
- A *One Stop Accelerator Shop*

Products

radiabeam TECHNOLOGIES

- Turnkey accelerators
  - Turnkey injectors
  - Transport lines
  - Industrial linacs
- Diagnostics
  - Beam profile monitors
  - Bunch length monitors
  - Charge, emittance, et cetera
- RF structures
  - RF photoinjectors
  - Bunchers
  - Linacs
  - Deflectors
- Magnet systems
  - Electromagnets
  - Permanent magnets
  - Systems (chicanes, final focus, spectrometers)





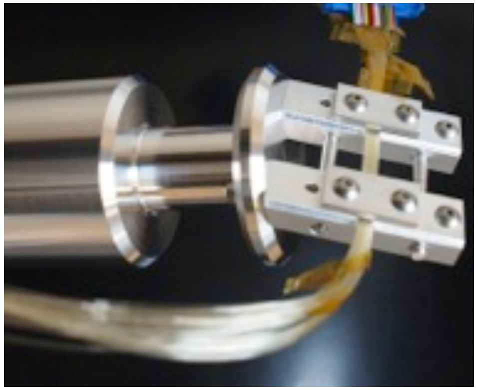
Customers

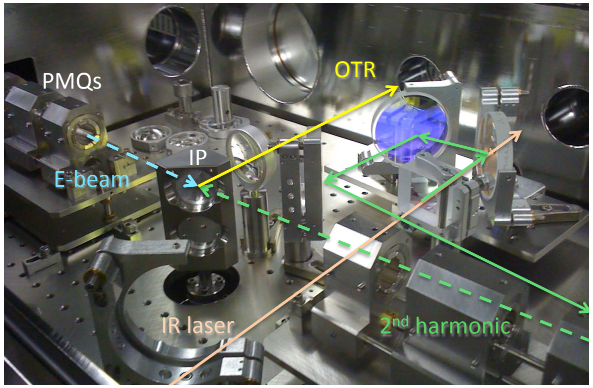
radiabeam TECHNOLOGIES

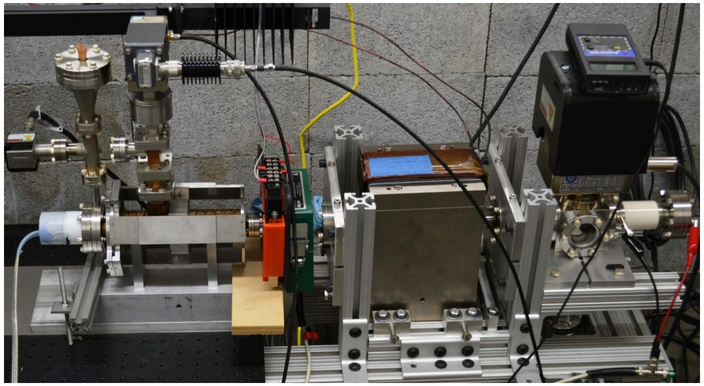
Argonne National Laboratory
CINEL
ISL
KAERI
iba
TeamBest – healthcare for everyone – Your True Partner
SPARKLE Radiopharmaceuticals
University of Colorado
CERN
University of Hawai'i Mānoa
NSRRC
University of Nebraska Lincoln
東京大学 The University of Tokyo
NIOWAVE Accelerating Your Particles
Schlumberger
ACCURAY
Sterigenics
Fermilab
SIEMENS
Yale University
Lawrence Livermore National Laboratory
EUROTEK
Mizzou University of Missouri - Columbia
TRIUMF
excillum
BROOKHAVEN NATIONAL LABORATORY
UCLA
Kungl Tekniska Högskolan
TRAD Tests & radiations
Berkeley Lab
European Spallation Source
LNLS Laboratório Nacional de Luz Síncrotron
INFN Istituto Nazionale di Fisica Nucleare
Oak Ridge National Laboratory
Wright State University
Idaho Accelerator Center
Centre for Advanced Technology, Indore
PAL
Canadian Light Source – Centre canadien de rayonnement synchrotron
Ariel University
ENEA Ente per le Nuove Tecnologie, l'Energia e l'Ambiente
Indiana University Bloomington
Sandia National Laboratories
CANDLE
Los Alamos National Laboratory
Wisconsin University of Wisconsin-Madison
Michigan
KIT Karlsruher Institut für Technologie
FERMI @elettra
SLAC National Accelerator Laboratory
MAX IV
SOLEIL Synchrotron
Vanderbilt University
Paul Scherrer Institut PSI

Research & Development

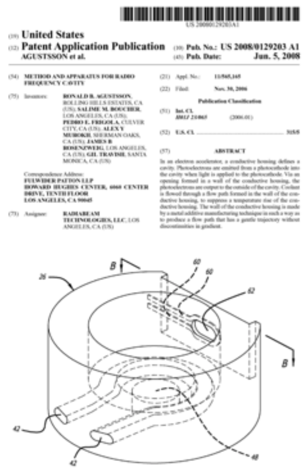
- Average research budget of $5m per year supported primarily by US funding agencies
- Focus on novel acceleration schemes, compact sources, precision diagnostics, and **advanced fabrication techniques**
- Collaborate with leading international institutes and scientists







Additive manufactured Niobium


United States
Patent Application Publication
AGUSTSSON et al.
Pub. No.: US 2008/0129203 A1
Pub. Date: Jun. 5, 2008

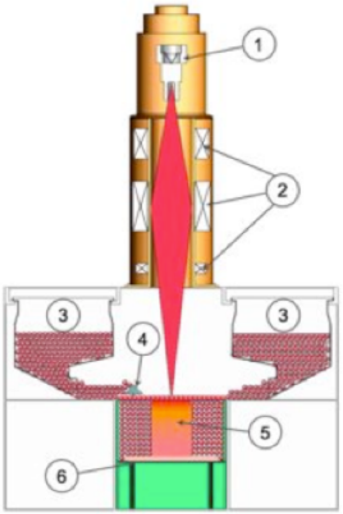

Fabricating Copper Components with Electron Beam Melting

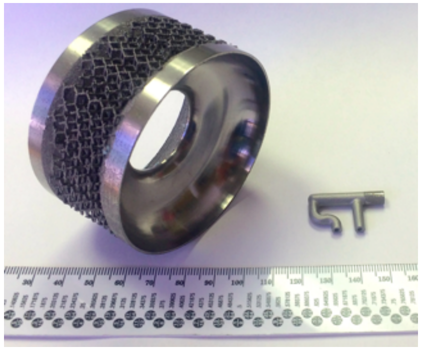
- Additive manufacturing techniques allow for higher average power and otherwise impossible designs
- Layers of atomized metal powder is selectively melted with an electron beam
- Allows for nearly monolithic, seamless, and thermally-stabilized SRF niobium structures of arbitrary shape at **reduced cost**
- First to develop the electron beam melting additive manufacturing process for copper and niobium
- Since 2006, $3.5m investment in copper, niobium, and Ti-Nb joining with electron beam melting techniques

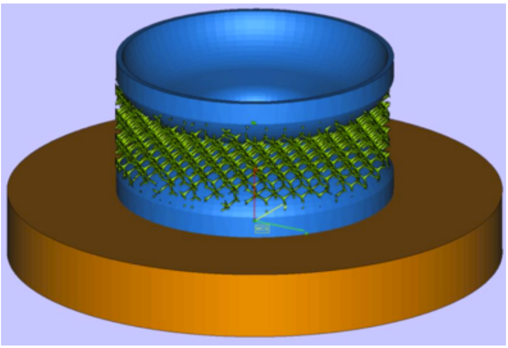
US Patent 7,411,361: *Method and apparatus for radio frequency cavity*;
Joint patent with JLab - pending: *Additive Manufacturing Method for SRF Components of Various Geometries*

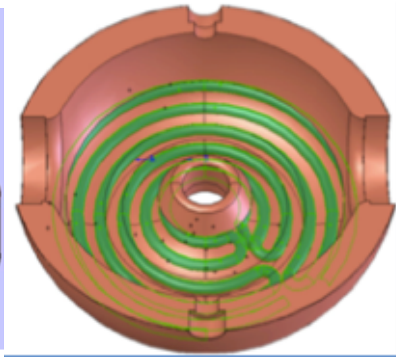
EBM material development summary

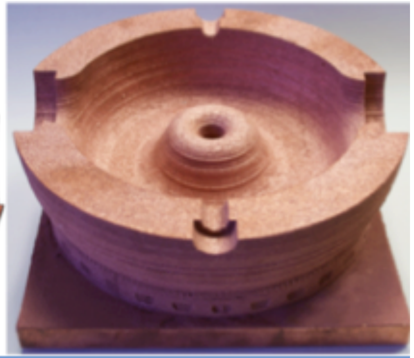
- EBM AM advantages:
  - Cost/time savings
  - Excellent material properties
  - **Freedom in design**
- Need a larger investment in developing the process
- Further refinement of the apparatus and its operating parameters











RadiaBeam for Future Colliders

- RadiaBeam's wealth of experience and efficient R&D program make it ideal for development of enabling technologies
- Additively manufactured niobium compliment and extend the capabilities of future colliders with proper attention

- We can serve as a supplier, integrator, and collaborator
- Our expert team is always available for discussion

- EBM AM Acknowledgements
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