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National Lab Day

Lectures

10-8-2019

Montana Technological University Energy R&D Capabilities

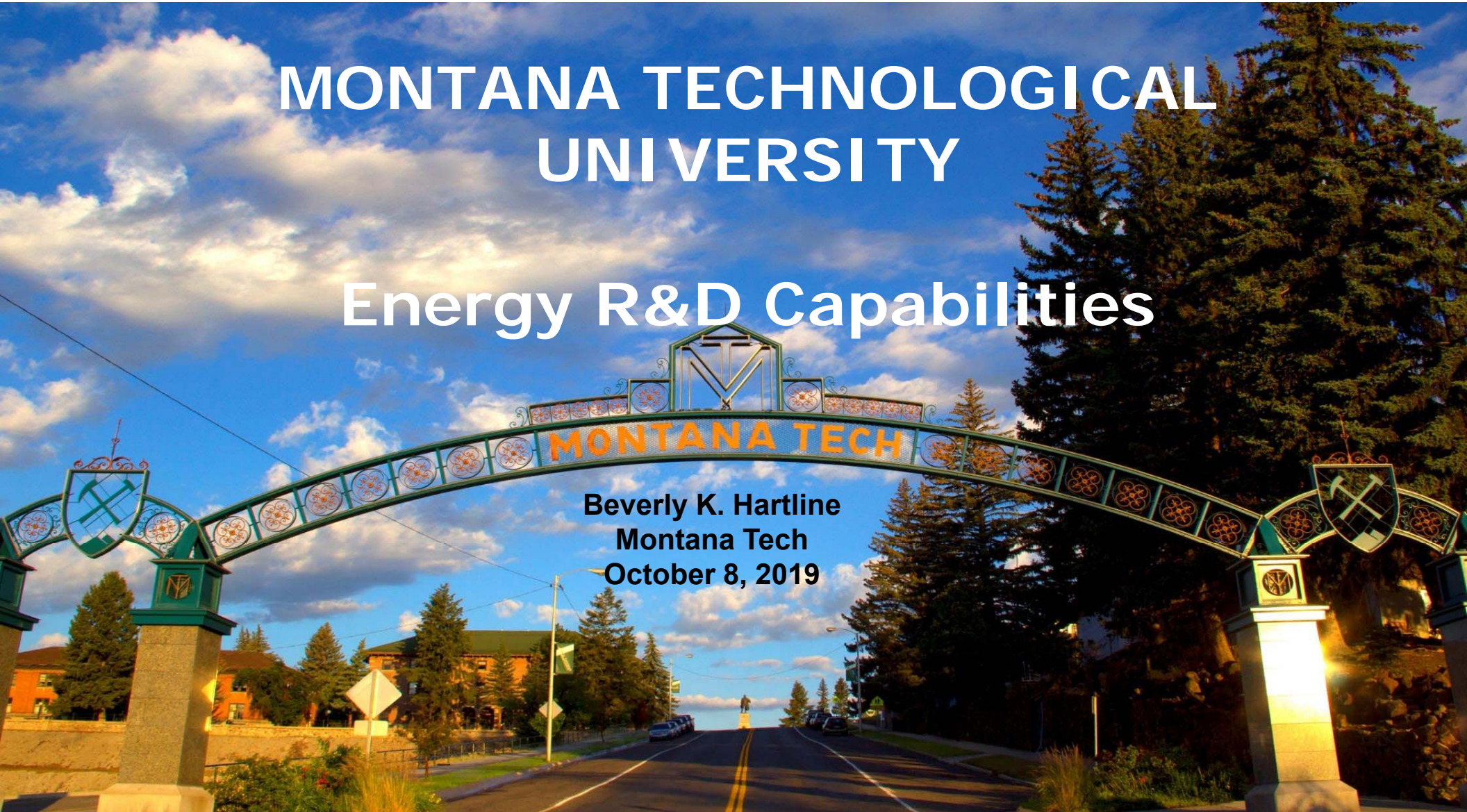
Beverly K. Hartline

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MONTANA TECHNOLOGICAL UNIVERSITY

Energy R&D Capabilities

Beverly K. Hartline
Montana Tech
October 8, 2019





About Montana Tech

- Established with land grant by the Statehood Act for Montana in 1889
- Opened in 1900 as Montana State School of Mines

Mission: Blending theory with practice and building on its heritage, Montana Tech provides exemplary undergraduate and graduate education, workforce development, research, and service to meet the changing needs of society and the responsible development and use of natural resources.

- **Montana's Special Focus, ~80% STEM university**
 - ~2500 students, ~10% graduate students
- **Includes Montana Bureau of Mines & Geology (MBMG)—a state agency**

Many Accolades and High Rankings



BEST VALUE SCHOOLS



THE WALL STREET JOURNAL



smartasset™

**#1 Best Value Engineering School
in USA—2nd Year**
Bestvalueschools.org 2019

#1 (tie) in Top Public Schools
US News 2018

Military Friendly School
Victory Media

**Top-200 School for Native
Americans—7th Year**
*American Indian Science &
Engineering Society*

#1 in USA for Advancing the Economy
Edsmart.org

#1 Best Value University in Montana
SmartAsset.com

**#2 Best Value Occupational Safety
Degree Program**
College Values Online

**A Top Public University for Return On
Investment**
The Wall Street Journal

Highly Ranked for Social Mobility
College Net

MontanaTech

Energy-Related “Workforce Development”

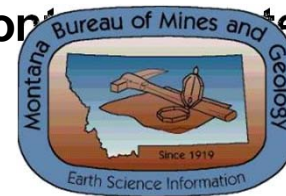


- Pre-Apprentice Line, welding, & machining certificates
- Associate’s degrees in automotive technology, metals fabrication, drafting, & precision machining
- 12 ABET-accredited B.S., including petroleum, electrical, metallurgical & materials, mining, mechanical, geological engineering, occupational safety, & computer science
- B.S. in math, chemistry, biology, & business—with “Land Manager” option
- Distance master’s for “working professionals” in industrial hygiene, project engineering management, and many engineering specialties (M.Eng.)
- On-campus master’s include materials science & engineering, industrial hygiene, petroleum, electrical, mechanical, metallurgical & mineral processing, & geoscience
- Graduate certificates in computational science & ecological restoration
- Ph.D. in materials science (collaborative program with Montana State University)



Distinctive Research Infrastructure

- **Center for Advanced Mineral, Metallurgical, & Materials Processing (CAMP)**
 - Academic Center of Excellence engaging faculty & students across the campus in forefront sponsored research on materials, metallurgy, mineral processing, and agile manufacturing
- **Underground Mine Education Center**
 - >1 km tunnel, ~30 m underground on western edge of campus
 - Research & learning in mining, rock mechanics, safety, electrical engineering, UAV testing, geothermal energy, & other fields
- **Montana Bureau of Mines & Geology (MBMG): Montana geological survey**
 - Groundwater & surface water,
 - Geological mapping, GIS, earthquake studies



• **Montana HPC Cluster: 26 nodes, 91 TB storage, ~20 TFLOPS**



Energy-Related Research Examples

- **Geophysical surveys and studies, including of Hanford**
- **Materials & manufacturing**
 - Metallurgy, mining, minerals, & materials processing
 - Rare earth processing, separation, & recycling
 - Agile manufacturing: additive, welding, resonant mixing, nanotech
- **Water:** quantity, quality, hydrogeology, & geosciences
 - Groundwater, surface water, snowpack
- **Energy:** extraction, transmission, storage, security, & sustainability
 - Horizontal drilling & enhanced recovery of oil and gas
 - Electric grid control & reliability
- **Restoration ecology & environmental engineering**
 - Supporting capability: high performance computing, 3-D visualization; economic development, entrepreneurship, innovation & engineering management



Welcome to Montana Tech & Butte

- **Graduates are in demand**
 - Great education with ~93% placement rate
 - Highly discounted tuition for students from western states
- **If your schedule allows, please sign up for 1-hour lab tour, to start at 11:30 am Wednesday**
 - Nanotechnology cleanroom
 - Safety lab for instruction & research
 - Student project & machine shop facilities
 - Geophysical survey capability
 - Materials & manufacturing labs
 - Petroleum engineering labs
 - Montana Bureau of Mines & Geology

