

## Entrepreneurial Assets Subcommittee Draft

The charge of the Entrepreneurial Assets Subcommittee was to make a list of courses, organizations, programs, initiatives, researchers, and staff members who are involved with entrepreneurship in some way. This includes tenure-track, non-tenure-track/lecturers, graduate students, and staff. Many of the activities and people on this list have been around entrepreneurship for several years, but some are insular and may not be aware of each other. The multi-disciplinary information collected here will contribute to the development of a University of Wyoming ecosystem that will assist economic development and other aspects within our state.<sup>[1]</sup>

The bottom line is that entrepreneurship-focused academic programs exist across campus, but they need to be united to allow the entrepreneurship ecosystem to flourish, and to further support statewide economic diversification. For this to be most effective, a central location (or “front door”) should be established to provide experiential learning opportunities for Wyoming students, strengthen partnerships with Wyoming businesses and community colleges, and promote research and entrepreneurial endeavors.

*At this point, this is likely not an exhaustive list, but it is a good start for the first draft. The list is divided into entrepreneurial activities/research and teaching/educating others to be entrepreneurial or support entrepreneurship. It is only a list of what is currently happening, not what these areas propose to do in the future. For classification purposes, it is broken into Colleges.*

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<sup>[1]</sup> Information about innovative ways to make money for the units or the University were sent to other subcommittees in this pillar.

### College of Agriculture & Natural Resources

*College-wide: Teaching/Education:* The overall curricula is focused on training and educating agriculturalists, veterinarians, scientists, and students as entrepreneurs in ag production and service industries

*Agriculture and Applied Economics: Entrepreneurs/Activities:* Faculty members have research in entrepreneurial areas, such as negotiation analysis, agricultural risk management, and supply chain coordination. Teaching/Education: Stackable certificates in areas of need in the state and regions, such as ranch management, food policy, agricultural entrepreneurship, risk management, or personal finance. Class in Agribusiness Entrepreneurship.

*Agricultural Communications: Teaching/Education:* Overall program promotes entrepreneurship since many students build their own businesses, return to established family businesses, or support the marketing efforts of agriculture businesses

*Family & Consumer Sciences: Entrepreneurs/Activities:* Spin off textile company.

Teaching/Education: Several classes training students to be entrepreneurial.

*Extension:* Leader in community-based education and statewide engagement with the land-grant university as the foundation. Active engagement with Wyoming people, institutions, and communities demonstrates UWE’s commitment to our organizational values, including innovation, entrepreneurship, and respect. Community-based support creates opportunities for resource development.

*Molecular Biology Department: Entrepreneurs/Activities*: Thomas Boothby, filed intellectual property claims about novel bioprotectants; Grant Bowman, CEO of AsimicA (biotech startup); Mark Gomelsky, patent holder and interested in developing his light-biosensors for medical use; Don Jarvis, CEO of Glycobac LLC (biotech startup); Dan Wall, exploratory efforts to identify novel antibiotics; Jongchan Woo, exploring chemical modifiers of autophagy as novel cancer treatments.

*Plant Science: Entrepreneurs/Activities*: Vertical hydroponic system used by Plenty was developed by former Ph.D. student Dr. Nate Storey (Plenty Co-founder and Chief Science Officer). Royalties from that invention support entrepreneurial research.

## **College of Arts & Sciences**

*Communication & Journalism: Entrepreneurs/Activities*: Cindy Price Schultz researches digital media entrepreneurship and management; *Teaching/Education*: Minor in Marketing Communication combines marketing and communication classes. Business and Professional Communication is part of the Entrepreneurial curriculum; numerous classes in the department have Wyoming businesses for clients, such as Advertising, Multimedia Production, Public Relations, Graphic Design, Rhetoric & Social Justice, Web Design, and Photography.

*Geology & Geophysics: Entrepreneurs/Activities*: John Kaszuba, Joint Industry Project with ConocoPhillips. He is also the John and Jane Wold Centennial Chair and works with the Wold Companies and Wold Foundation.

*Math & Statistics: Entrepreneurs/Activities*: Ken Gerow, National Park Service grant; Craig Douglas, Stephan Heinz, Rongsong Liu, Zhuang Niu, and Ping Zhong, NSF grants of different types regarding modeling and data; Hakima Bessaih, Jason Williford, and Ping Zhong, Simons Foundation grants; Ken Gerow & Annalisa Piccorelli, NIH grants; Tim Robinson & Shaun Wulff, grant with the Wyoming Department of Health to provide data science expertise. Robinson also has a US Fish & Wildlife grant and Wulff, one with Wyoming Department of Transportation. *Teaching/Education*: Eric Quade, NASA Space Education Enhancement Grant; Jason Williford taught an online course for practicing high school and college teachers in game theory last summer.

*Music: Entrepreneurs/Activities*: Musicians can book gigs with the “Hire A UW Musician” link. *Teaching/Education*: Nicole Riner oversees the Music Entrepreneurship Certificate. She also teaches the courses in entrepreneurship.

*Philosophy & Religious Studies: Entrepreneurs/Activities*: Rob Colter organizes Stoic Camp for Corporate retreat; Brad Rettler studies cryptocurrency

*Psychology: Entrepreneurs/Activities*: Robin Barry and the Dementia Support Center. Applications of current work include a home and community-based services organization. Training programs being developed could be marketed to providers. Josh Clapp and Sean McCrea have collaborations with faculty in College of Engineering, grant-funded research intended to optimize human-machine interactions and develop mobile applications for voice training in transgender community, grant-funded research on use of videogames to motivate motor and cognitive rehabilitation, consulted on development of posture-control apparatus; Chris McKibbin and Wyoming Center on Aging: Worked with a tech development company to assist with the development of an online intervention. WyCOA also has worked on a CNA Apprenticeship Program that supports training and employment for CNAs. *Teaching/Education*: Matt Gray, Professional Issues and Ethics (PSYC 5530), focuses on setting up a private practice and developing an independent clinical career (including telehealth outreach to rural

communities); Clinical Ph.D. program: APA accredited program, graduates eligible for professional licensure in most US states and territories; students get training in their practicum teams on advertising and recruiting, collecting fees, managing patient flow, and using empirically supported, short term therapies to maximize efficient use of therapist's time; Clinical faculty have also offered workshops/professional development for providers in the community/state.

*Theatre & Dance:* Teaching/Education: Curricula provide entrepreneurial skills; collaborative nature of performances, internships and senior projects builds a comprehensive skill set for students to be successful in a company, or in the company they found.

*Visual & Literary Arts:* Entrepreneurs/Activities: Ashley Carlisle, Winddriven Studios with David Jones of Visual Arts. Large-scale public art projects and artworks for homes and businesses. Teaching/Education: Neltje Center for the Visual and Literary Arts, a place to honor and showcase the contemporary visual and literary arts and an educational facility for residencies, workshops, symposia, conferences, art exhibitions and literary readings.

Center for Design Thinking (Brandon Gellis, co-director with Amy Banic, Computer Science). Conducted in-person and online workshops exploring various approaches to Design Thinking and entrepreneurship. Working on a consumer-based project for projection with a client. Held a number of design, innovation, and entrepreneurship-oriented classes. FYS Innovation and Entrepreneurship course. Ashley Carlisle's Sculptural Practices and Professional Practices courses teach students idea generation, creative problem solving, invoicing, presentation, and bidding out a creative project, whether it is a public art piece, architectural accoutrement, or industrial design object.

### **College of Business**

*College level:* Entrepreneurs/Activities: Steve Farkas, assistant dean, support businesses across the state, including IMPACT 307, Small Business Development Center, and Manufacturing Works. Teaching/Education: Entrepreneurship major and minor. Major for COB students; minor for non-majors. (Patrick Kreiser, Peter Scott from CEAS). Experiential learning throughout curriculum.

*Management & Marketing:* Entrepreneurs/Activities: Ellbogen 50K Entrepreneurial Competition that helps student-led teams get seed money to start companies – Patrick Kreiser and Ronn Smith; Teaching/Education: Corey Billington, professor of practice. Classes incorporate a business or marketing plan for business in the state. Runs a Faculty Entrepreneurship workshop; Entrepreneur outreach programming in collaboration with Wyoming After-School Alliance offered to Wyoming Association of Career & Technical Educators that offers curricular assistance and professional development (graduate credit) for state high school teachers. Matt Fox.

### **College of Education**

Entrepreneurs/Activities: Faculty members have grant work and sponsored programs, such as the Preschool Development Grant, Augmented Reality, WITS, SWARMS, TACoS, GenCyber, and Special Education. Leigh Hall, one of the Excellence Endowed Chairs in Literacy Education, developed an online platform called Literacy Teachers, that guides online instruction so teachers can help their students become better readers and writers.

### **College of Engineering and Applied Science**

*Dean's Office: Entrepreneurs/Activities and Teaching/Education*: Peter Scott, Entrepreneur in Residence. Guest lectures on entrepreneurship in Senior Design classes and Pharma classes or other interested faculty. Part of Entrepreneurship faculty in College of Business. With Central Wyoming College, runs Entrepreneur Essentials course, a six-week statewide education program that the CoB and CEAS has for entrepreneurs across Wyoming. For the College, Entrepreneurship for Engineers elective and experiential work throughout the curriculum. Innovation Wyrkshop. The largest makerspace in Wyoming, and one of the largest and best-equipped in the Mountain West. Run by Tyler Kerr. Free and accessible to everyone. Training programs equip entrepreneurs with the tools necessary to make their ideas/prototypes a reality. Grant funding to set up a targeted entrepreneurial program (the Pioneer Program) to serve as a network between entrepreneurs and trained makerspace users. (See Appendix B).

*Atmospheric Science: Entrepreneurs/Activities*: The department in essence runs a small not-for-profit business, although it is not registered as such for tax purposes. It has sufficient external funding to employ 15 people without any UW/state support. Building initially on research grants for atmospheric instrumentation, it has had several business offshoots over the years.

*Chemical Engineering: Entrepreneurs/Activities*: David Bell, research funded by the Carbon Engineering Initiative, a state-funded SER program that seeks to convert Wyoming coal to non-fuel products.; John Oakey, tools and techniques related to Biomedical Engineering that span development readiness levels and appropriateness for commercialization. Has launched a startup company to commercialize several innovations; Patrick Johnson. Teaching/Education: David Bell, Process Design I and II, the capstone chemical engineering classes. Many projects involve potential business ventures in Wyoming.

*Civil & Architectural Engineering: Entrepreneurs/Activities*: Jon Brant, Director of the Center of Excellence in Produced Water Management, which focuses on the development of nanofibrous materials for applications, such as filtration and desalination. It targets resource recovery from industrial brines like produced water or municipal waters; Michael Urynowicz, CEO at EnWyo, LLC and Chief Technical Officer at Cowboy Clean Fuels. Cowboy Clean Fuels, along with its technology partner EnWyo, LLC, was formed in 2020 to commercialize the UW-owned patent, Biomass-Enhanced Natural Gas from Coal.

*Computer Science: Entrepreneurs/Activities*: Ruben Gamboa, business creation of three software companies; Philip Schlump, professor of practice and entrepreneur; Lars Kotthoff & Mike Borowczak serve as technical advisors to Wyoming startups; Teaching/Education: Amy Banic, co-director, Center for Design Thinking, and co-teaches a FYS course in entrepreneurship; Senior Capstone Course has led to business creation.

*Electrical and Computer Engineering: Entrepreneurs/Activities*: John Pierre, with two professors at Montana Tech University, has a patent in the area of oscillation analysis in power systems using synchrophasor measurements; Suresh Muknahallipatna, in collaboration with McGinley Orthopedics, an Augmented Reality-based medical device to aid surgery was developed and sold to hospitals nationwide. In collaboration with Simplot Agriculture, in Rock Springs, is developing a drone-based measuring device to perform volumetric measurements of fertilizer piles.

*Mechanical Engineering: Entrepreneurs/Activities*: Erica Belmont, co-founded a start-up company with one of her Ph.D. students to commercialize technology that they developed under an NSF EAGER grant. They have won awards from the Ellbogen Entrepreneurship Competition and the WY Phase 0 program, and currently have their first SBIR proposal under review; Carl Frick, co-Founder of Impressio.Tech, which has two current SBIR Phase 1 grants from NSF &

NIH and employs one former UW student. Co-inventor on one fully issued patent and numerous invention disclosures while at UW. Technical Lead for I-Corps teams; Dmitri Mavriplis, Owner of Scientific Simulations LLC, which has had four SBIR/STTR Phase 2 awards over the last 10 years, including active Phase 1 & Phase 2 SBIRs from NASA. The company employs three former students/postdocs from UW; Jonathan Naughton, Director of the Wind Energy Research Center. Founded two Wyoming start-ups as a UW faculty member and involved with three. Cumulatively supported by many federal grants, including several SBIRs and STTRs. Currently employs four former students. Teaching/Education: In the senior capstone design course, more than eight student groups have been finalists of the Fisher Innovation Launchpad during the past five years.

*Petroleum Engineering: Entrepreneurs/Activities*: Mohammad Piri, Director of the Center for Innovation for Flow in Porous Media, has developed a commercial enterprise, Piri Technologies; Hertanto Adidharma, Morteza Dejam, Maohong Fan, Lamia Goual, Mohammad Piri, Soheil Saraji, and Brian Toelle have been involved in six patent developments of the last two years. These developments cover the range from patent approved, provisional patent application, and patent disclosure.

### **College of Health Sciences**

*Kinesiology & Health: Entrepreneurs/Activities*: International Kinesiology Center; Derek Smith & Arthur Zhu and an undergraduate student perform research funded by a NSF undergraduate research fellowship. MoVE LLC fosters student innovation, while Zhu and Smith teach technology transfer and translating ideas to marketable products through graduate coursework and student mentorship.

*School of Pharmacy: Entrepreneurs/Activities*: The Wyoming Health and Bioscience Innovation Hub is housed in the School of Pharmacy. This is a public-private partnership to support bioscience innovation and entrepreneurship from initial idea, through proof of concept, pre-clinical and clinical testing, regulatory approval, and commercialization. Teaching/Education: Nervana Elkhadragey, Pharmacy Management, Marketing and Finance (PHCY 6246) includes a module on entrepreneurship.

### **College of Law**

Teaching/Education: George Mocsary teaches a Entrepreneurship & Business practicum that started in 2019. The course gives students a combination of classroom training on entrepreneurship and small business law, practical experience performing legal tasks for Wyoming small businesses, and networking opportunities to let them hit the ground running in Wyoming's small business ecosystem upon graduation.

**University Libraries: *College Level: Entrepreneurs/Activities***: Stephen Boss, in conjunction with Cynthia Hughes, has a project related to how rural libraries can support entrepreneurs, such as developing technology spaces for entrepreneurs and small businesses; Ivan Gaetz is planning an internal working group to outline best practices for libraries to support economic development activities. He also convened a Blockchain working group to investigate possibilities for libraries support and partnership. Teaching/Education: Entrepreneur meeting space on Level 1 of Coe Library, a formal meeting area where students can hold pitch and funding meetings, and develop their ideas and present them; the collections team licenses statewide access for business and related databases and journal subscriptions to support local entrepreneurs and small businesses

throughout Wyoming (in partnership with the Wyoming State Library); provide library instruction and research/ chat support for faculty, staff, and state residents doing research on entrepreneurial projects.

*American Heritage Center: Teaching/Education*: The AHC has a number of collections from entrepreneurs in many different fields, especially in the late 19th and early 20th Centuries.

**Haub School of Environment & Natural Resources: Teaching/Education**: Tourism minor has many entrepreneurial and outreach-oriented classes to help businesses in Wyoming; entrepreneurial mindset throughout curriculum.

**School of Energy Resources**: Multi-disciplinary research initiatives underway in the centers of excellence. Projects are intended to spur development of Wyoming businesses and commercialization of energy technologies. Several graduates create their own businesses.

### **Other entities not under a college**

*Advising, Career, Exploratory Studies Center (ACES): Teaching/Education*: ACES and the other career services offices on campus (including in the College of Engineering and Applied Science and College of Business) are connected to entrepreneurship through the job posting, the internship platform Handshake, Job Fairs, employer engagement staff that work directly with companies and organizations sourcing talent, and a Live Local Work Local program that takes UW students to Wyoming communities to explore what it would like to live and work in that area. The SOAR program and Suitable software provide student engagement in career readiness activities that build and document their experiential learning, internship and research experiences.

*Wyoming Institute of Disabilities: Entrepreneurs/Activities*: Eric Moody, research includes a physician from Cody using machine learning to support aging in place (vs moving elderly patients to nursing homes), and a company in Boulder, CO. working on a device to support children with Autism Spectrum Disorder. Collaborator with Arthur Zhu from K&H on his Small Business Technology Transfer grant on a device to support tele-rehabilitation.

### **Associated entities**

**IMPACT 307** is a network of innovation-driven business incubators that advise and support high-growth startups in the early stages of business development. IMPACT 307 works to diversify Wyoming's business landscape, fostering creative, solution-based ideas that add value to the state and local economy. David Bohling is director and Fred Schmechel is assistant director.

**Wyoming Technology Transfer and Research Products Center** supports entrepreneurial efforts by working with UW faculty, staff, and students to develop a robust protection and commercialization plan ranging from patent applications to copyright registrations. It also supports entrepreneurial efforts through licensing UW technology to UW spinouts and third party companies, and providing education about intellectual property as needed for undergraduate students, graduate/professional students, and UW faculty. Directed by Victoria Bryant.

Small Business Development Center, Business Resource Network, and Manufacturing Works. The subcommittee did not receive information from these entities, so a summary should be added about their contributions.

Where does the Wyoming Innovation Network fit?

**Appendix A: University of Wyoming SPIN-OUT Companies**

<b>Company</b>	<b>Year Founded</b>	<b>UWYO Faculty/Student</b>
CellDrop Biosciences, Inc.**	2020	Oakey, John Noren, Benjamin Scott, Peter
Literacy Teachers*	2019	Hall, Leigh Ann
MoVE, LLC	2018	Zhu, Qin
Piri Technologies*	2017	Piri, Mohammad
MKS Technology	2017	Carron, Keith
TLS Materials LLC	2016	Dongmei (Katie)Li
Lev'sonic, LLC	2016	Levente Pap Keith Carron
FieldBlogger, LLC	2016	Bryce Tugwell
Teton Composites	2016	Andrew Hansen
SHARK Science Outreach LLC	2016	Bruce Parkinson
Aseman LLC	2016	Seyed Hamid Sanei
Medicine Bow Pharmaceuticals LLC	2015	Baskaran Thyagarajan
Catering Calculator	2015	Kenneth McConnel
Bridge Sense, LLC	2014	Mike Jung
NutriWyo, LLC	2014	Sreejayan Nair
Pollution Control Technologies, LLC**	2013	Robert Corcoran Kaspars Krutramelis Rodolfo Monterroso
ESal, LLC	2013	Teresa Nealon
Arnoldware Applications, LLC	2013	Mark Arnold
PlankTOMICS Algae Bioservices*	2013	Stephen Herbert Levi Lowder
Alpenglow Instruments LLC	2013	Nicholas Mahon
Project Guide Services LLC	2013	Chet Lockard

		Robbie Lockard
GlycoBac, LLC*	2011	Don Jarvis Christoph Geisler
Bright Agrotech*	2010	Nathaniel Storey
Snowy Range Instruments	2010	Keith Carron
ENWYO LLC*	2010	Michael Urynowicz
EnvisionFinancials, LLC	2010	Jeremy Page
WyoComposites, LLC*	2009	Dave Walrath Heath VanEaton
TigerTree Land Management	2007	Jeffery Smith Emily Parsons
Happy Jack Software	2004	Mona Gamboa Jeffery Van Baalan
Train for Power Systems LLC	2004	JeNey Jackson
Firehole Technologies*	2001	Andrew Hansen Chris Key Randal Six Steve Mays Mark Garnish Jared Stack
Supercritical Fluids LLC*	2001	Maciej Radosz
DeltaNu*	2000	Keith Carron Robert Corcoran
Blue Sky Group Inc.*	1998	John Pope Daniel Buttry
SoftRay Incorporated*	1997	Paul Johnson
WEST, INC	1990	Dale Strickland Lyman McDonald
Bridgetech, Inc.	1988	Jay Puckett
IDES Prospector	1986	Mike Kmetz

\*Companies that have a direct license with UWYO (patent/software)

\*\*License agreement is in negotiations and is expected to be executed soon



## Appendix B

### List of Makerspaces in Wyoming

- There are ten major makerspaces in Wyoming. Tyler Kerr runs the largest one at UW, and his team oversees five additional makerspaces around the state (Casper, Cheyenne, Pinedale, and Evanston). Powell, Riverton, Sheridan, and Gillette make up the remainder. Western Wyoming Community College is considering in setting up a space there.
- The team has designed a robust, standardized, institutionally agnostic experiential learning ecosystem (the "Maker Access Pass") that the majority of other makerspaces in Wyoming have asked to be able to use. By end of year it will be live in nine of Wyoming spaces, and at least one out-of-state makerspace.
- Powell Makerspace (Northwest College) has asked to join the large library of free programming. The free, standardized workshop programming is the uniting factor for all of the makerspaces statewide. Similar to Powell, Riverton (Maker Space 307) and Sheridan (Phorge Makerspace) have inquired about joining the programming.
- With these three outside makerspaces (Powell, Sheridan, Riverton) included, the shared programming uniting the network would effectively be live in nine out of ten major makerspaces.