

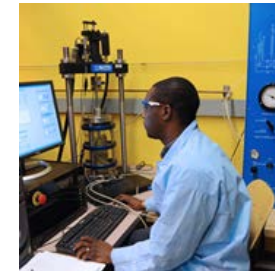
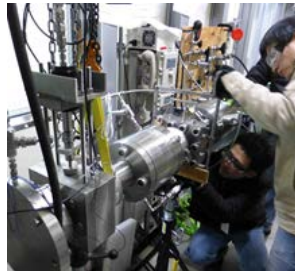


Center for Bio-mediated &
Bio-inspired Geotechnics



National Science Foundation
Award 1449501

Engineering Research Center for Bio-mediated and Bio-inspired Geotechnics



<http://biogeotechnics.org/>



College of
Engineering

CBBG Team

Four Universities - \$18.5M first 5 years (NSF), 2015-2020

NMSU share - \$3.2M

Cooperative agreement with NSF



Education/Diversity/Outreach Partners

K-12 programs, community colleges, science museums,
international partners

Industrial Partners

Full spectrum of diverse stakeholders - industry and government agencies



CBBG Guiding Principles

Learn from nature (i.e. from biological systems)

- 3.8 billion years of experience (evolution)
- Sustainable solutions to many vexing problems

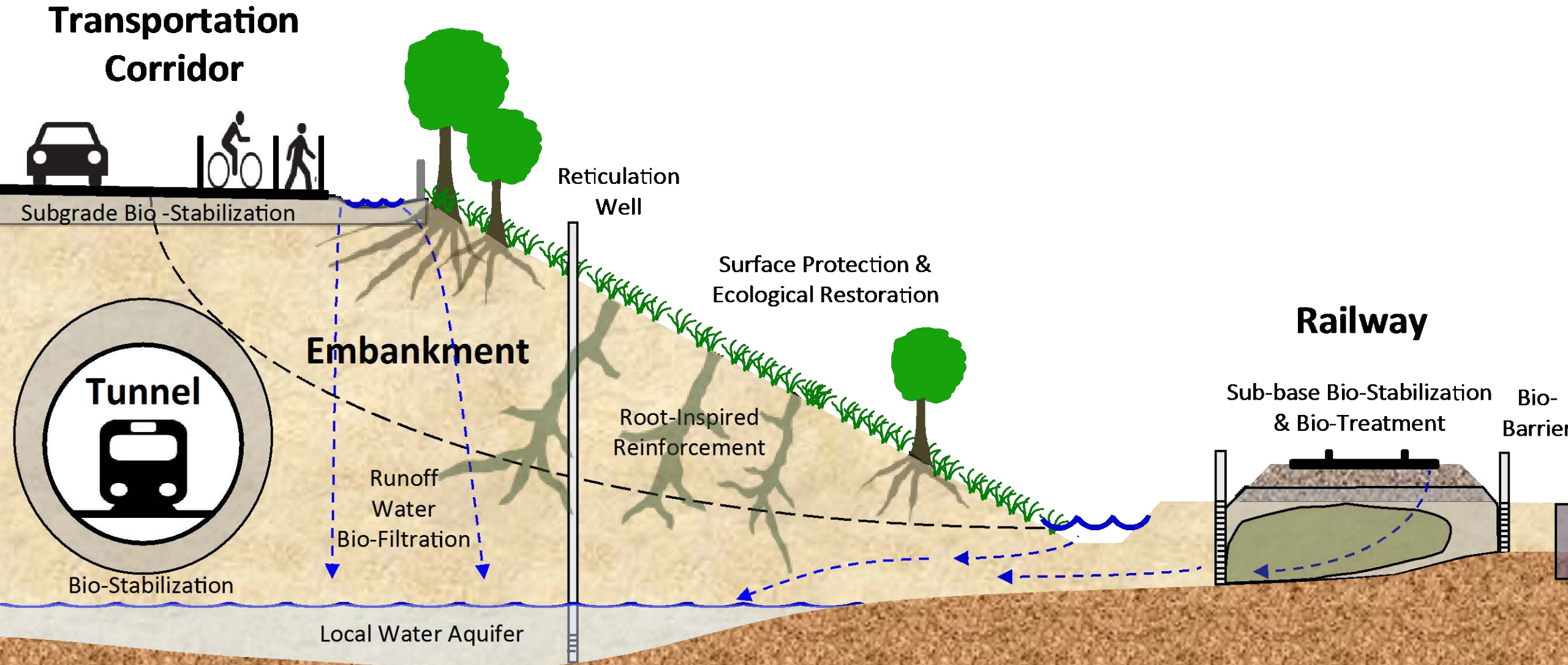


CBBG Objectives

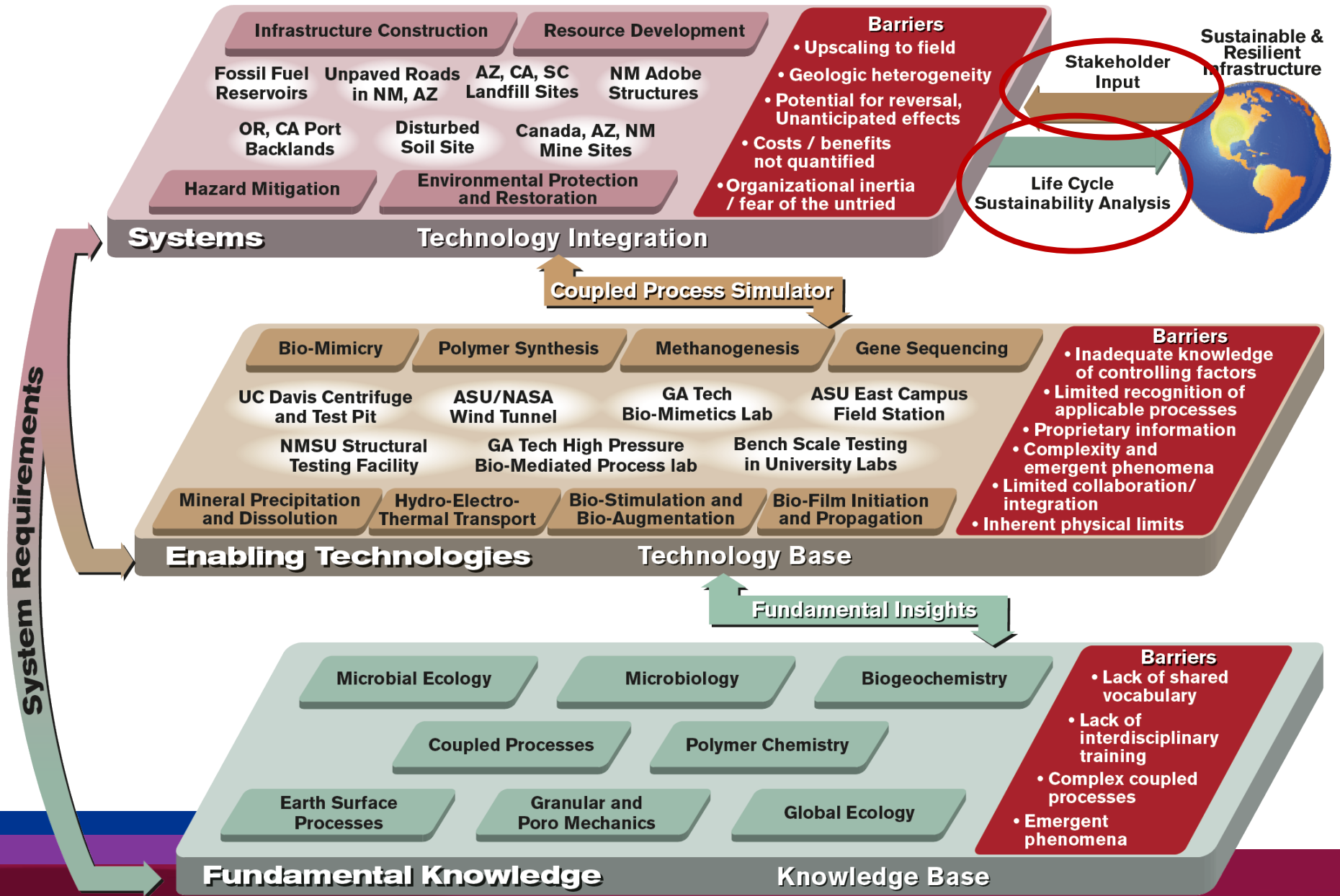
- Develop bio-mediated and bio-inspired solutions for geotechnical infrastructure-related construction, operations, and maintenance
 - *Reduce carbon footprint*
 - *Reduce non-renewable resource consumption*
 - *Enhance resilience*
 - *Mitigate environmental and ecological impacts*
- Inspire a diverse group of engineers and scientists to provide the associated workforce



CBBG Vision for the Future



Systems Engineering Framework



CBBG Research Thrusts

Thrust 1 – Hazard Mitigation

Thrust 1 Leader – DeJong (UCD)

Thrust 2 – Environmental Protection and Restoration

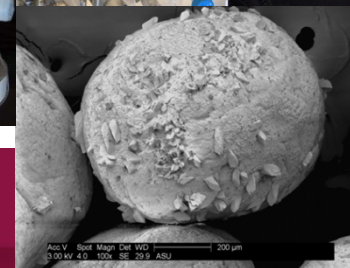
Thrust 2 Leader – Krajmalnik-Brown (ASU)

Thrust 3 – Infrastructure Construction

Thrust 3 Leader – Bandini (NMSU)

Cross cutting research

Leader – Frost (GT)



CBBG Faculty and Students at NMSU

Research

6 faculty

10 graduate students

4 undergraduates

2-4 REU students each summer

2 SCCORE students (CC transfers) each summer

Education, Diversity and Outreach

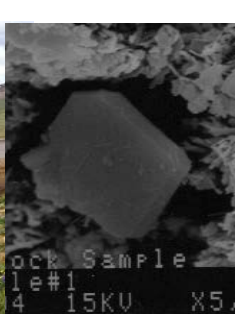
2 faculty (Education and Engineering)



NMSU Students at
2016 CBBG Annual Meeting

CBBG Research at NMSU

1. Bio-inspired soil reinforcement (piles) (T3)
2. Project GUSANO: utilitarian subterranean annelid inspired geo-probe (CC)
3. Microbially enhanced iron-modified zeolite permeable reactive barrier (T2)
4. Rehabilitation and restoration of degraded soils using liquid organic fertilizer (T2)
5. Bio-inspiration for resilient earthen construction (T3)
6. Activated landfill for rapid organic degradation (New in Year 2) (T2)

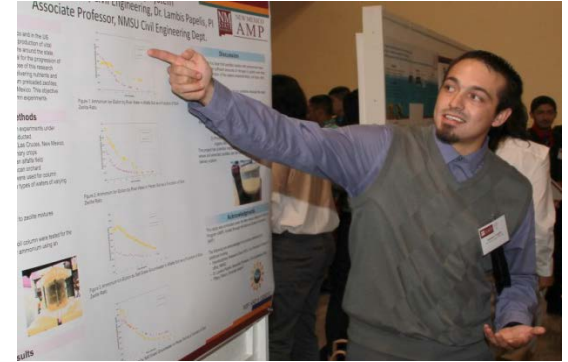


Accomplishments & Activities

CBBG student selected for **LAUNCH** entrepreneurship and commercialization program



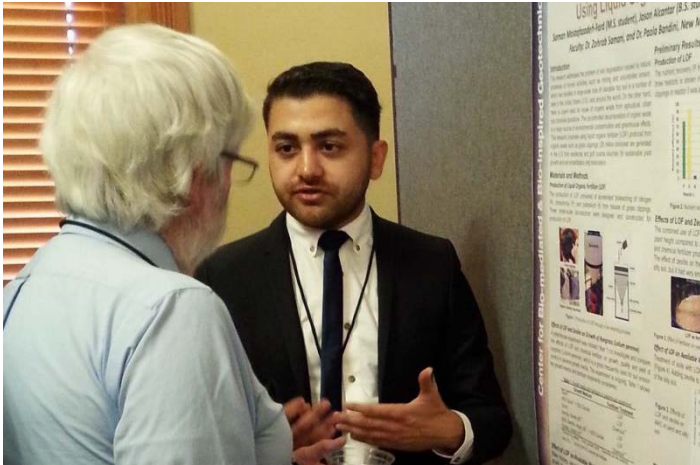
8 CBBG students graduated and continued into graduate school (5) and industry (3)



NMDOT joining CBBG Industrial Partnership Program



NMSU graduate student wins **first place** in research poster presentation



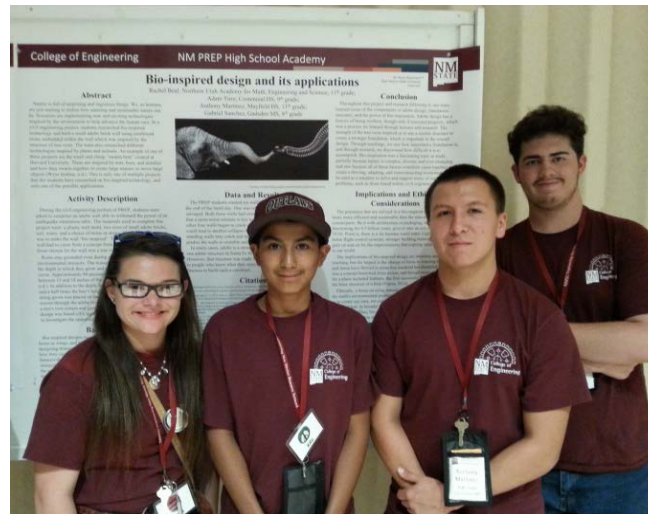
Research collaborations:

- Visiting scholars (national & international)
- NMSU student to work in ASU lab



Outreach

- CBBG module for Pre-Freshman Engineering (PREP) summer camp
- Bio-inspired Resilient Earthen Construction
- 2-day activity, 44 high schoolers
- Bio-inspired design, sustainability and infrastructure resilience





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