

9. Ideas for research and Q&A



Geotechnical and Geological Engineering with Melanges, Fault Rocks and Other Bimrocks

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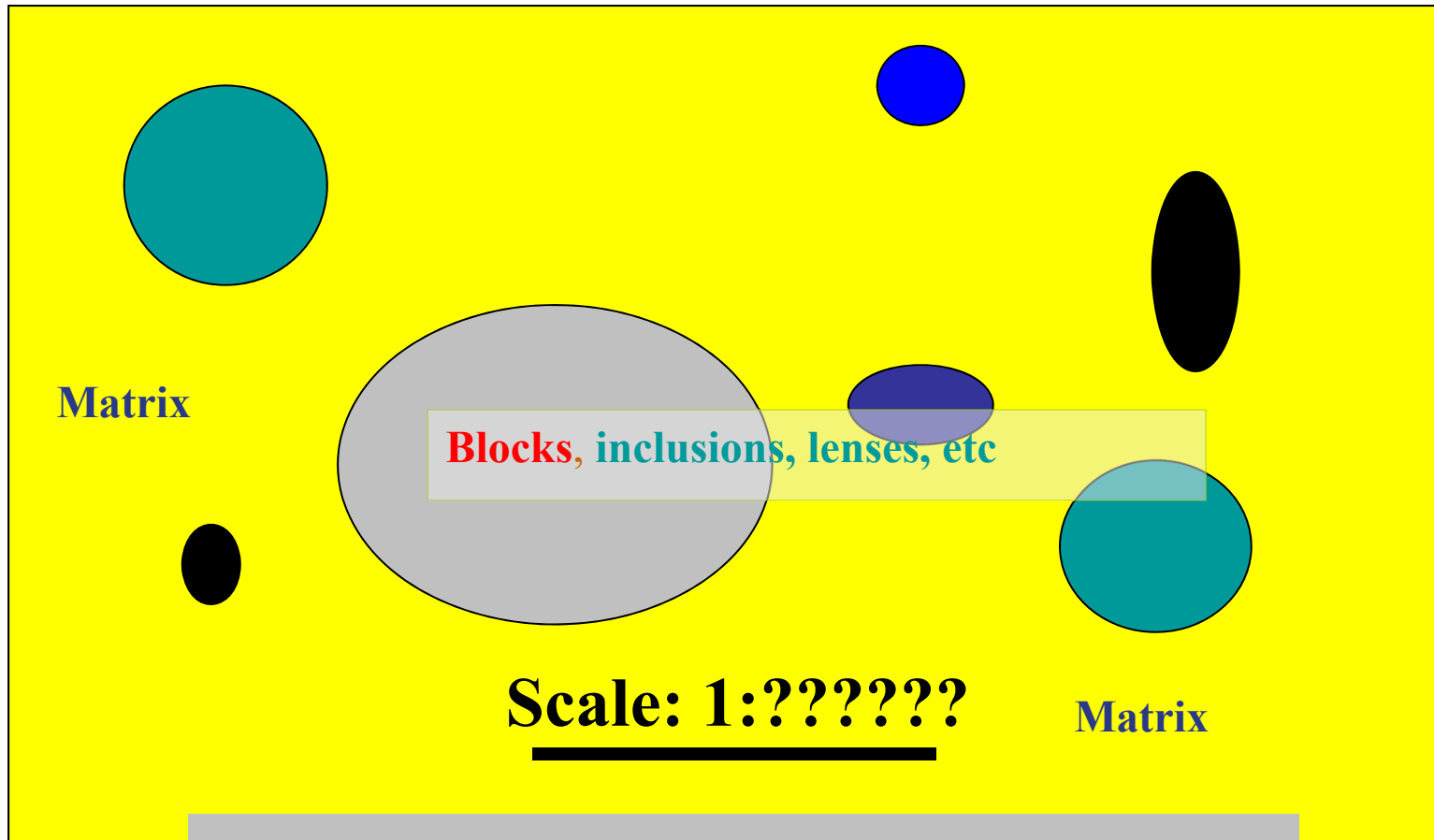
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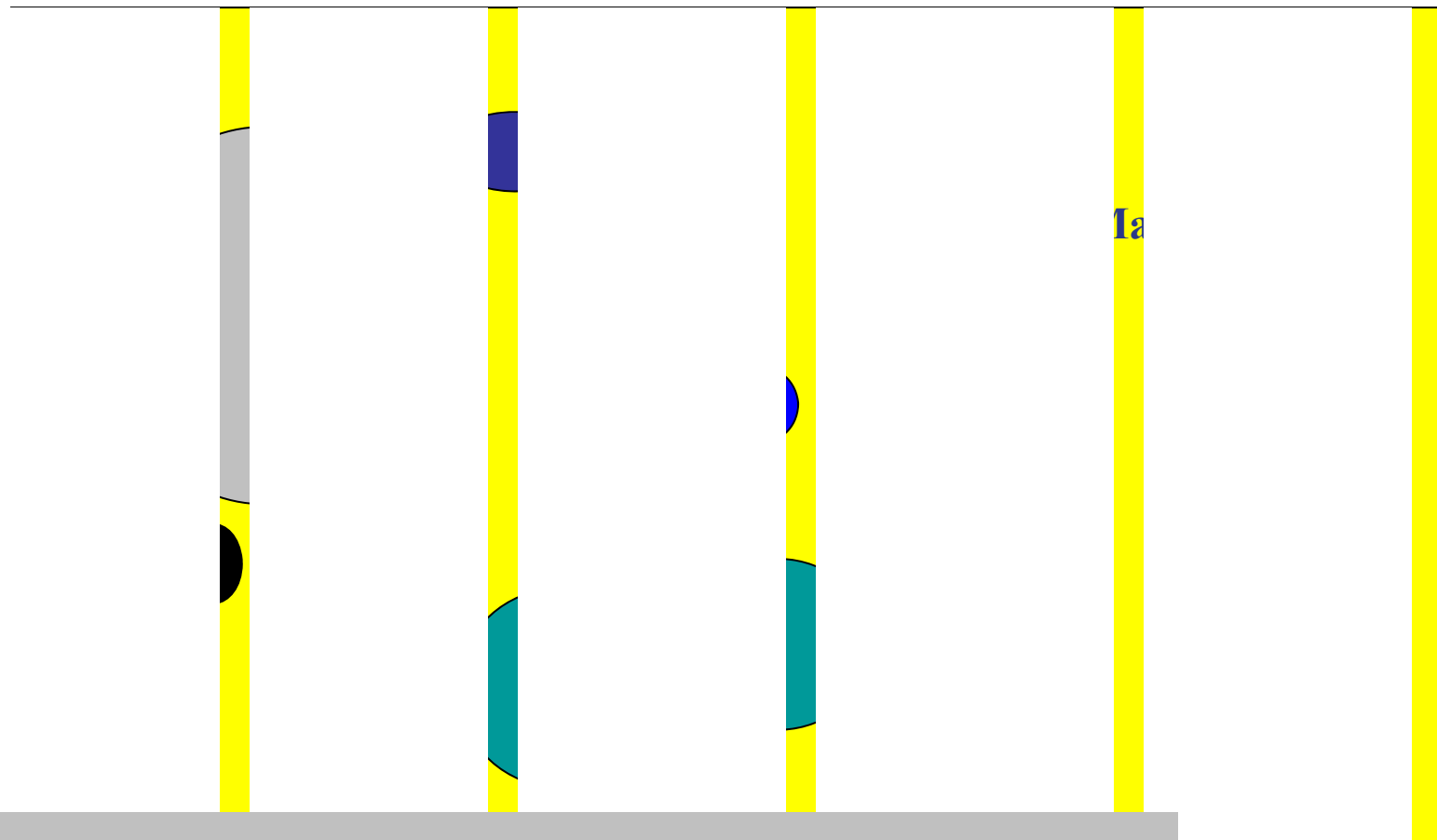
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BIG CONCLUSION 1: Remember this picture!!!



Actual Distribution of Blocks

BIG CONCLUSION 2: Remember this picture as well!!!



Apparent Distribution of Blocks

Suggested Ideas for Research

There are several possible avenues of cooperative research between geologists and geopractitioners:

- Confirm the original research by Medley (1994) in which measurements of d_{mod} from 2D maps and photographs of outcrops yielded several important conclusions (scale-independence, the block/matrix threshold size, the concept of characteristic dimension, etc). The 1990s work was performed using 2D sources but it is now clear that 2D measurements of blocks can be very erroneous measures of actual 3D block sizes.
- Understand better the effects of block/matrix contrast strength on the overall mechanical behavior of bimrocks: in other words extend the work of Sonmez.
- Develop virtual bimrocks using numerical modeling methods to simulate bimrock masses under controlled conditions; and, investigate geomechanical behaviors of model bimrocks with variations in block/matrix strength/stiffness contrasts, block shapes and sizes, block size distributions and spacing.

More Ideas for Research

- Survey how various geological disciplines characterize the complexity of the range of geological mixtures, such as ore bodies within waste rock, fault rocks, and discontinuous contaminated soil and groundwater within pristine geology.
- Develop statistical, geostatistical and stereological approaches to understanding and predicting the uncertainties of our estimates of rock block volumes, sizes, shapes, orientations, etc., based on the limited drilling and mapping exploration tools available to geologists and geopractitioners. This work would extend and confirm the research of Y.M Tien.

Even More Ideas for Research

- Understand better the complex hydrogeological interactions within stressed rock-soil mixtures by learning from structural geology and geomechanics.
- Develop a database of characterization/design and construction experience in bimrocks, such as the recent tunneling experience of Spreng et al. (2008) and Roadifer (2009) in Franciscan melanges.
- It is apparent that most bimrocks can actually be considered bimsoils, given that a “soil” is material that can be excavated by conventional construction earthwork equipment. As such, the field of research could become more attractive to geotechnical engineers and academics

More and More Ideas for Research

- Extend conventional geotechnical analytical techniques such as slope stability analyses to bimrocks/bimsoils by using the finding that expected failure zones are between 0.05 and $0,15L_c$ in width. In that case, trial “failure zones” can be created and conventional “trial surfaces” can be constrained within the zones and thus analyzed.
- Learn from Industry the costs of mischaracterizations of bimrocks and focus attention on those problems
- Convene a Conference on the Geological Engineering and Geotechnical Engineering with Complex Geological Mixtures. It has been over 30 years since the last conference on the engineering of “Complex Formations” was held.
- Someone, Somewhere write a book on bimrocks and bimsoils!

QUESTIONS????

Thank You All for

Listening

Asking

Staying Alert

Playing the Hand Game

and, saying, so many times: *Humuhumunukunukuapua'a*



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