Experimental Smartphone-synchronized Ground station Grid ESG-Grid

University of Louisiana at Lafayette
Home of the successful
CAPE 1 and CAPE2 Missions
Based upon Mobile Grid Computing Research,
Dr. Paul Darby,
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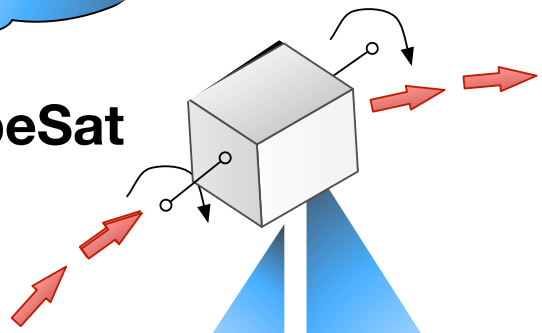
Contract # LEQSF(2014-17)-RD-A-13

UNIVERSITY of LOUISIANA Lafayette

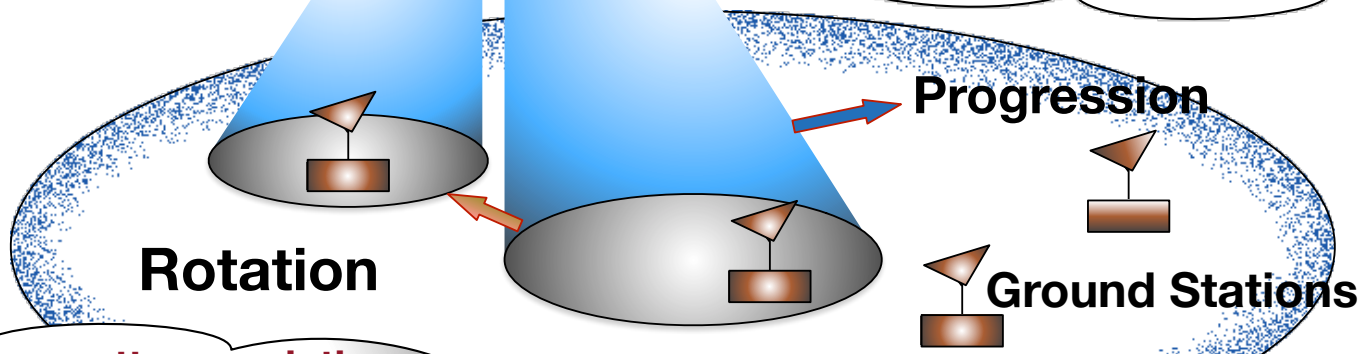
The Problem

CubeSat stabilization is challenging

Spin rate and Axes are difficult to control



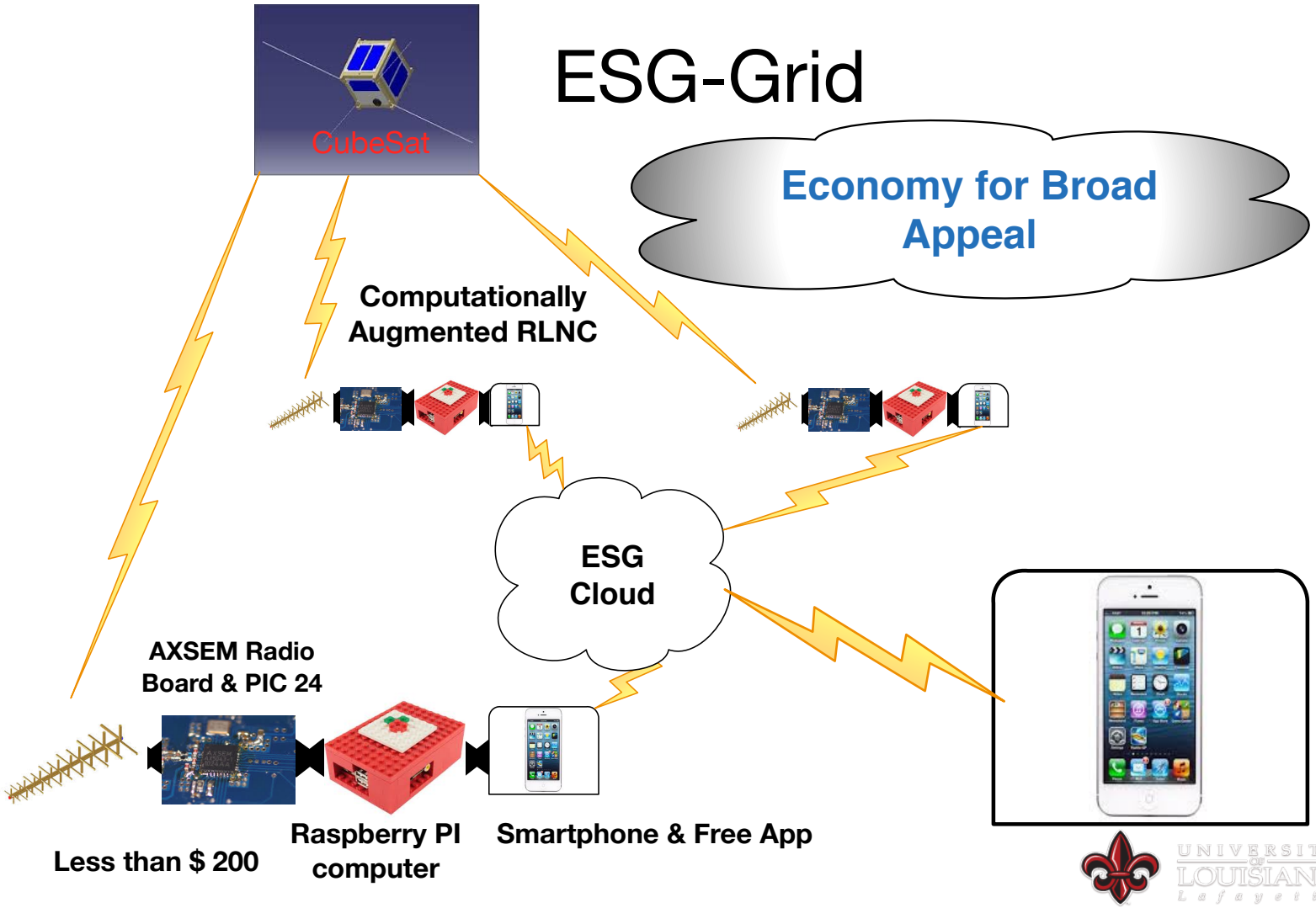
Nulls may interrupt the link and the message or a portion may be dropped



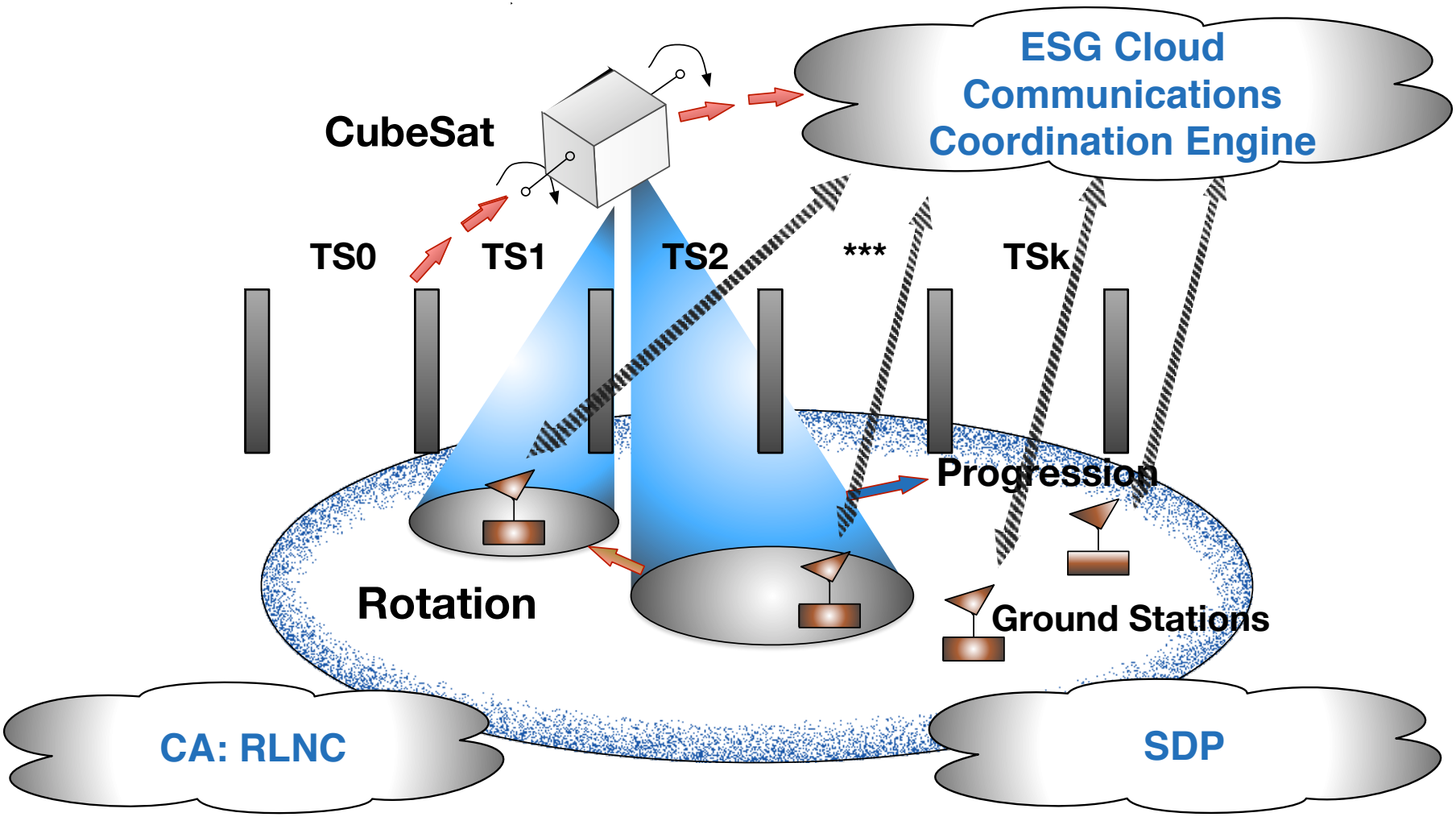
Antenna pattern variation at ground stations is problematic for efficient communications

Relatively Short Communications Window

Experimentation: Vehicle for Increased Educational Outreach

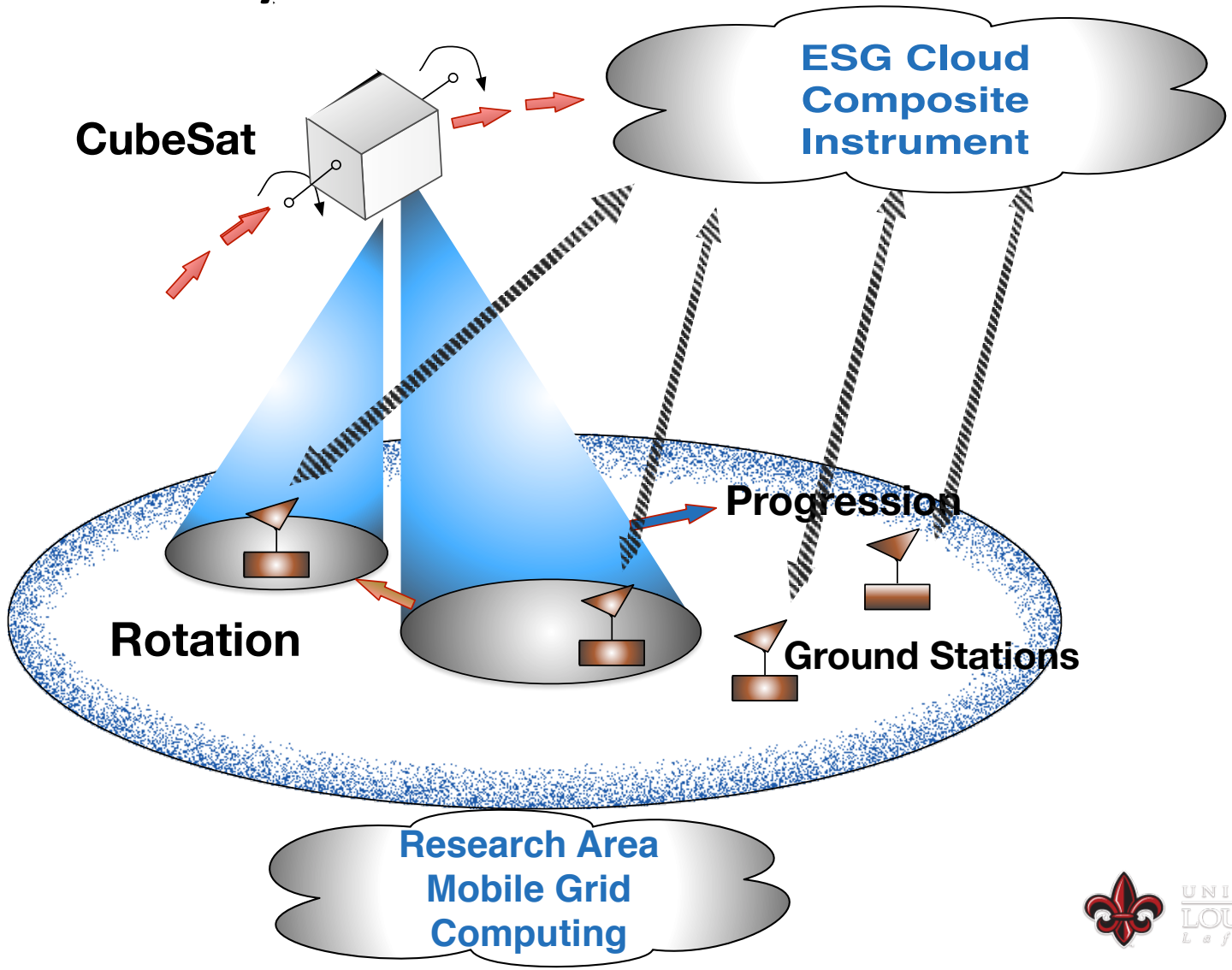


Experimentation: Efficient Communications

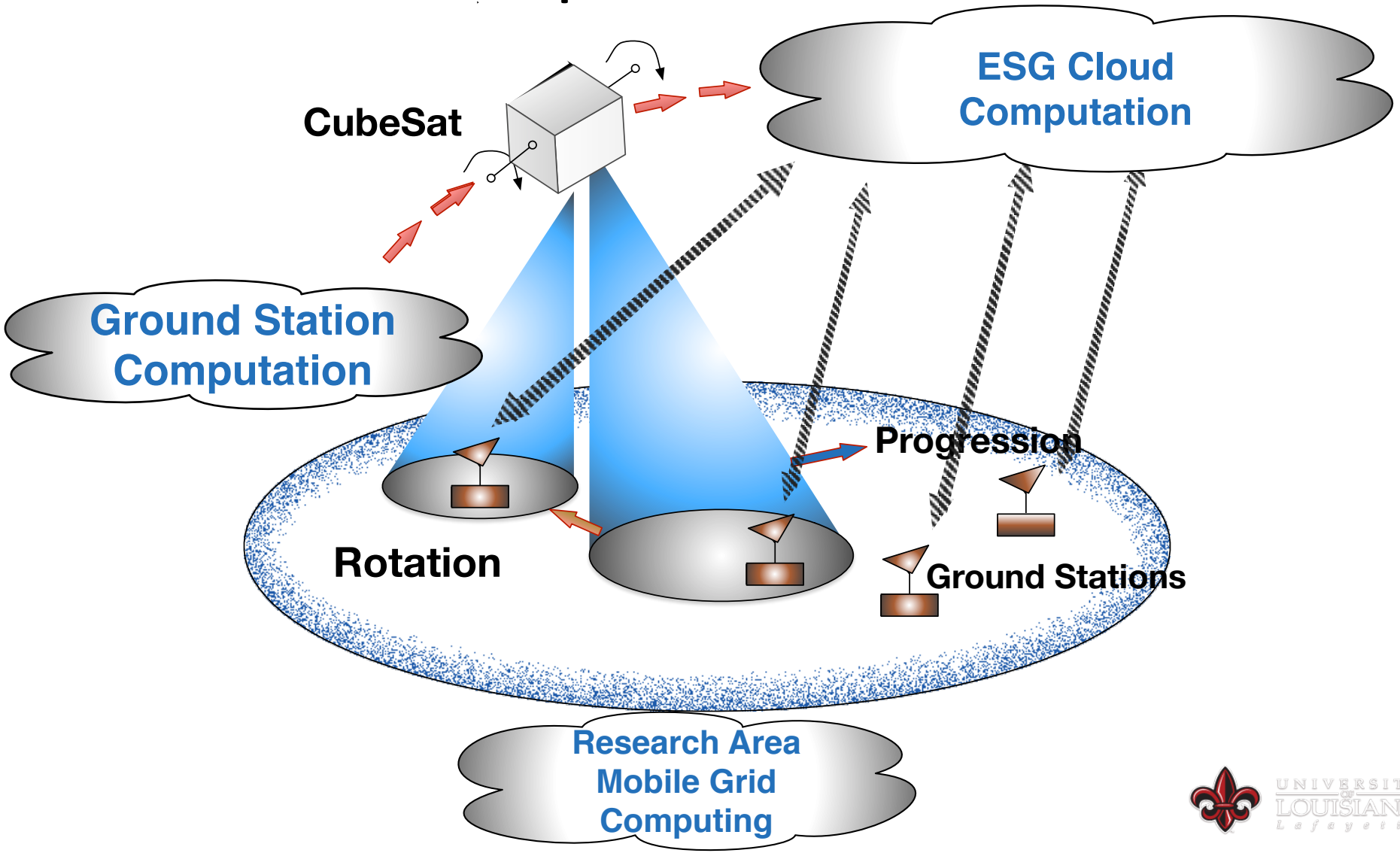


P_0	P_1	****	P_k	****	****	****	P_m

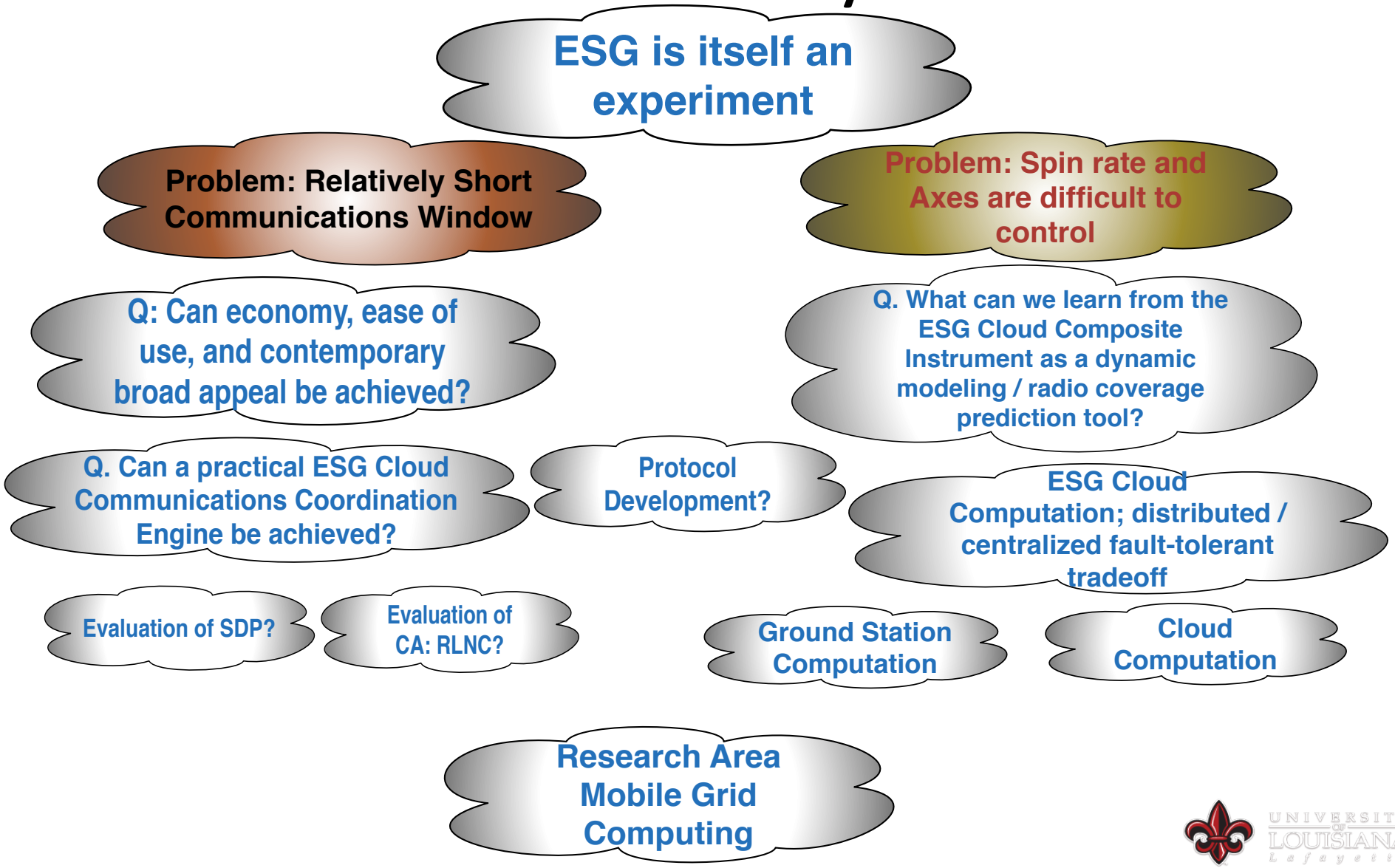
Experimentation: Capture & Predict Dynamic Behavior



Experimentation: Distributed Fault-tolerant Computation Coordination



Summary



References

- [1] P. Darby and N. Tzeng, "Decentralized QoS-Aware Checkpointing Arrangement in Mobile Grid Computing," *IEEE Transactions Mobile Computing*, vol.9, no.8, Aug. 2010, pp.1173-1186.
- [2] P. Darby and N. Tzeng, "Peer-to-Peer Checkpointing Arrangement for Mobile Grid Computing Systems," Proc. of *the 16th IEEE Int'l Symposium on High Performance Distributed Computing* (HPDC-16), June 2007.
- [3] S. Chachulski, M. Jennings, S. Katti, and D. Katabi, "Trading Structure for Randomness in Wireless Opportunistic Routing," *Proc. of the 2007 Conference on Applications, Technologies, Architectures, and Protocols for Computer Communications* (SIGCOMM 2007). Aug. 2007, pp. 133-144.