Writing for Funding and Publication

- Two VERY distinct areas
  - –Publication (Journals, Abstracts…)
  - –Funding (Getting dollars)
- Two introductions to two topics today
- And some PowerPoint tips!

Common Themes

- Both are peer-reviewed
- Serving as a reviewer is professional responsibility.
- Telling a story to sell:
  - An observation or interpretation
  - An idea to make observations
- Both are based on **The 3 T's**
  - Tell 'em what you're gonna tell 'em
  - Tell 'em
  - Tell 'em what you just told 'em
- Write for your audience!

Overview:

Writing in Science:

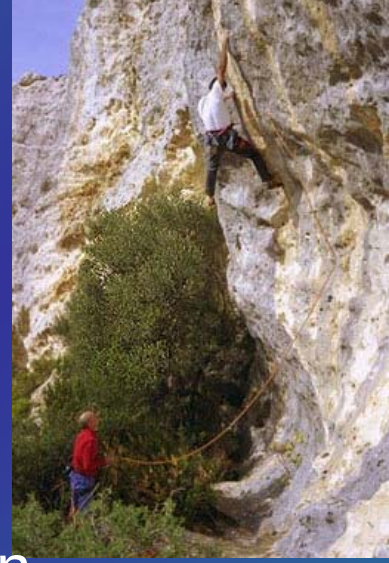
- On becoming a scientist
- First Attempts at science writing
- Research Proposals
- Peer-reviewed Publications
  - The Citation Index

http://www.oso.tamucc.edu/pals/writing.pdf

On Becoming a Scientist

- The Scientific Method at *Science Fair*
  - Hypothesis, Collect Data, Analyze, Report
- Writing format is thus fixed at an early age
  - Every report will have the same subheads.
  - Same required content.
  - Null hypothesis (here's how NOT to do something) is acceptable, so anything goes.
- Deadly boring to read.

In Reality…



- A Big Chunk is missing that that *standard* format…
  1. **Observation** and description of a phenomenon.
  2. Hypothesis to explain the phenomena; a causal mechanism or a mathematical relation.
  3. Test the hypothesis by predicting results of other similar phenomena.
  4. Recommendations for future work.
  5. Replication of the experimental tests by several independent non-affiliated co-parallel investigators - outright acceptance on your arguments (Peer Review).
  6. Null Hypothesis just fine (but see #1-5 above)

Some Lessons from Early Writing Experiments

- Avoid personal pronouns and the royal "we"
  - Common phrasing errors and fixes:
    - I have demonstrated
    - These results demonstrate

    - I have observed these rocks
    - These rocks have been observed

- Incorporating citations in the text
  - Clumsy: Work by Smith [1988] shows that…
  - Suave: Smith [1988] showed that…
- Excess prose is frowned upon
- *Abstracts* are common. A self-contained and free-standing summary of the entire publication.

Common Writing Assignments

- Students
  - Research status reports for funding agencies.
  - Abstracts of current work for conferences
  - Poster Sessions
  - Thesis and Dissertation work
- Faculty or Research Staff
  - Research proposals
  - Peer-reviewed publications
  - Client-driven technical reports

The Research Proposal

- Most commonly issued by federal agencies
  - Request for Proposals (RFPs)
  - Announcement of Opportunities (AOs)
- The usual suspects
  - National Science Foundation (NSF)
  - National Institutes of Health (NIH)
  - NASA, DOE, NOAA, HHS, DOD, ONR…
- Private Foundations
  - Rarely offer open competitions

The Research Proposal II

- Announcements typically 15-30 pages
  - Program Description
  - Eligibility
  - Estimated funding total and number of awards
- Proposal Instructions
  - Topic limitations and review criteria
  - Page limits and sub-page limits
  - Budget
  - Cost Sharing and Indirect Guidelines
  - Due Dates (hard and soft)

~30-50 pages

The Research Proposal III

- Typical Failures
  - –Outright Rejection for failure to follow instructions (never reviewed)
  - –Doesn't address Program Goals
  - –Reviewers don't believe your science
  - –Reviewers don't think you have capacity
- Tips for Success
  - –Read and obey the Program Announcement
  - –Call the Program Officer beforehand
    - Let them know your proposal is coming
    - Pick their brains for a better understanding of program goals
  - –Focus your argument on the *benefits* of your work

The Research Proposal IV

- Virtually all sources transitioning to electronic submission
- NSF leads in Electronic Submissions
  - www.nsf.gov
  - Proposal Guidelines
  - Fastlane
- All Feds transitioning
  - www.grants.gov

Peer-Reviewed Publications

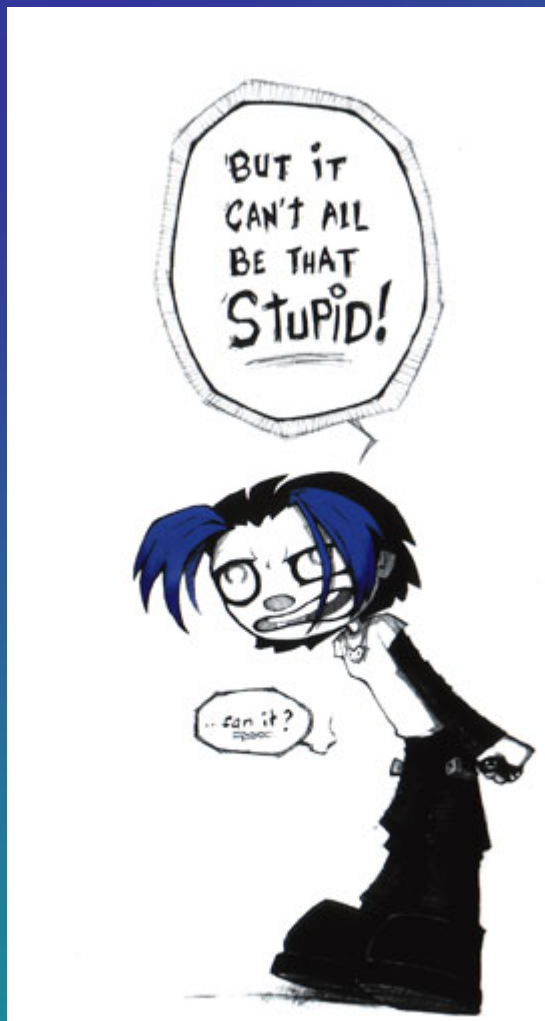
- *Journal Articles* or articles in *Proceedings* from annual meetings.
- Each article is part of an on-going conversation about a subject of interest to a group of scientists.
- Normal format:
  - Introduction
  - Background and Relevance
  - Boundary definition
  - Observations
  - Evaluation of observations and possible explanations
  - Statistical analysis of results
  - Least controversial conclusion
  - Recommendations for future work

Peer-Reviewed Publications II

- Page Charges
  - Text ~$150-500/page
  - Black and White Figures ~$100-700 per insertion
  - Color images ~$2,000-5,000 each
- Multiple Prestige Levels
  - National Journals: Science, Nature
  - Professional Journals: JGR, ACM, Cell, Lancet, NEJM
  - Conference/Agency Proceedings (NASA, NIH, et al.)
    - ☹ Commercial Publishers: Elsevier et al.
    - ☹ Second Tier Professional Journals: *Southeastern Soil Science*
    - ☹ Tertiary Professional Journals: *Texas Journal of Science*
    - ☹ Gray Literature: Local Professional Journals and Websites

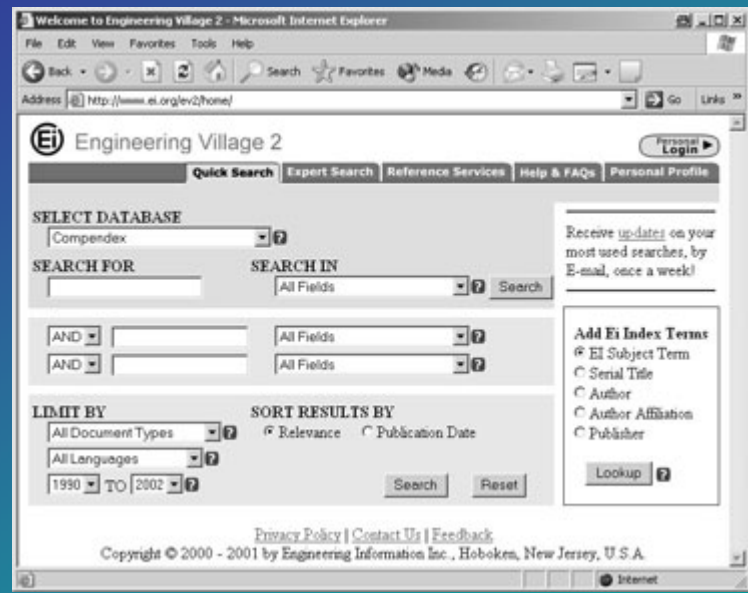
Peer-Reviewed Publications III

- How to get rejected:
  - Confuse cause and effect
  - Make unsupported inferences
  - Write about something completely novel
  - Fail to cite seminal research
  - Fail to cite the peer reviewers
  - Fail to establish relevance of your work
  - Misinterpret your statistics
  - Make a mathematical mistake
  - Fail to reach a reasonable (and usually non-controversial) conclusion



But did It Have Any Value?

- The Citation Index
  - Compiled and updated internationally each month.
  - Created by examining the bibliographies of every paper published in a peer-reviewed journal.
  - Can backfire. Being cited doesn't mean you are right.



Sample Listing

Citation Index for Grady Price Blount through Winter 2003-04

Fenton, L.K., Bandfield, J.L., and Ward, A.W., Aeolian processes in **Proctor Crater on Mars**: Sedimentary history as analyzed from multiple data sets, *Journal of Geophysical Research-Solid Earth,* 108 (E12), 5129, doi:10,1029/2002JE002015, 2003.

Muhs, D.R., Reynolds, R.L., Been, J., Skipp, G., Eolian **sand transport pathways** in the southwestern United States: importance of the Colorado River and local sources, *Quaternary International*, 104: 3-18, 2003.

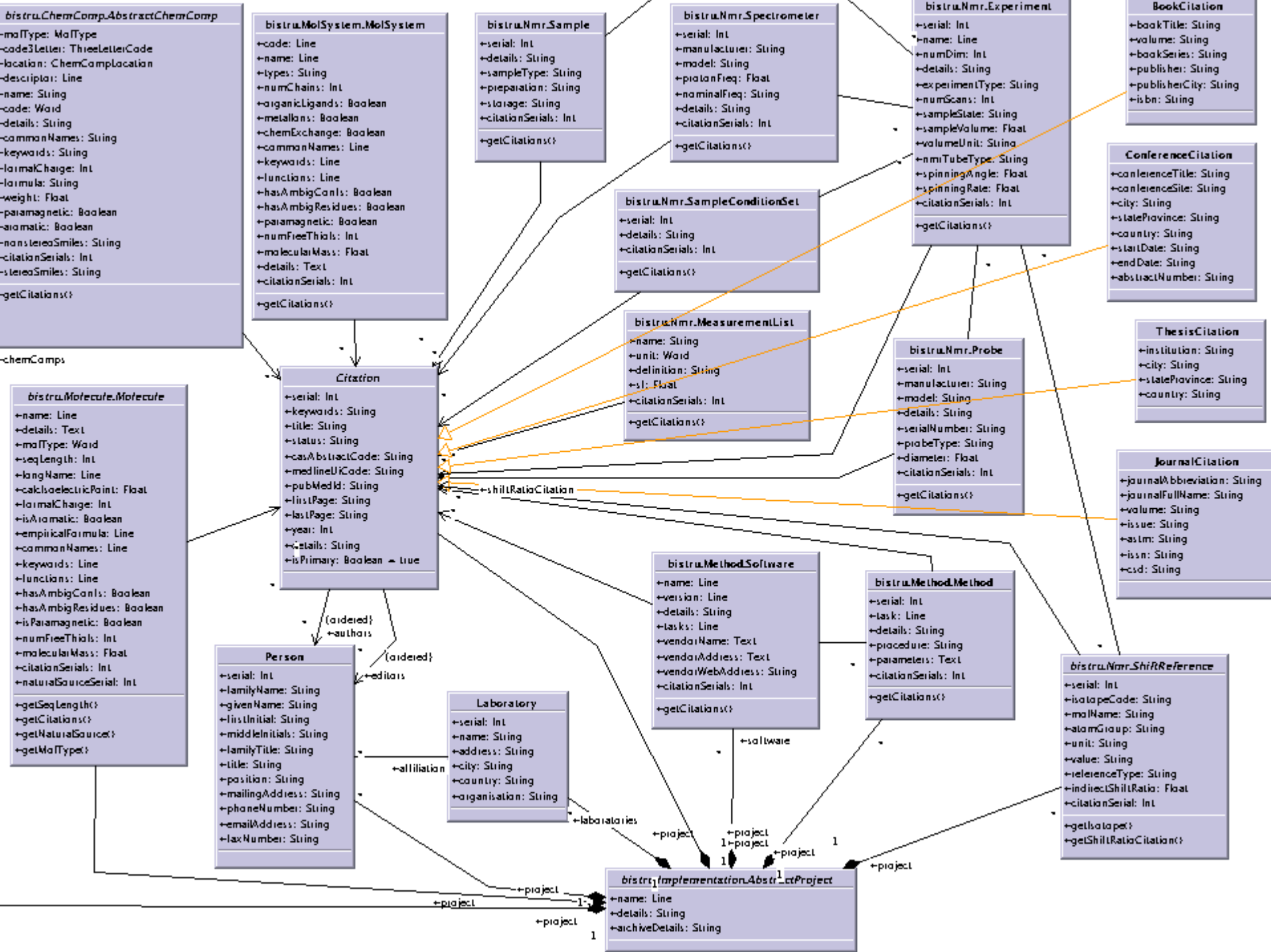
Bullard J.E. and White K., **Quantifying iron oxide coatings on dune sands** using spectrometric measurements: An example from the Simpson-Strzelecki Desert, Australia, *Journal of Geophysical Research-Solid Earth,* 107 (B6): art. no. 2125, June 2002.

Pease P.P. and Tchakerian V.P., **Composition and sources of sand** in the Wahiba Sand Sea, Sultanate of Oman, *Annals of the Association of American Geographers*, 92 (3): 416-434, Sept. 2002.

White, K., Livingstone, I., Gurney, S., Dearing, J., Bateman, M., **Post-processing of mineral mixture maps** for mapping surficial materials: the example of the Matmata loess, southern Tunisia, *International Journal of Remote Sensing*, 23 (15): 3091-3106. Aug. 10, 2002.

Carriquiry, J.D., Sanchez, A., and Camacho-Ibar, V.F., **Sedimentation in the northern Gulf of California** after cessation of the Colorado River discharge, *Sedimentary Geology*, 144 (1-2): 37-62 Special. Issue, SI Oct. 1, 2001.

Malin, M.C., Bell, J.F., Calvin, W., Clancy, R.T., Haberle, R.M., James, P.B., Lee, S.W., Thomas, P.C., Caplinger, M.A., **Mars Color Imager** (MARCI) on the Mars Climate Orbiter, *Journal of Geophysical Research-Planets,* 106 (E8): 17651-17672, Aug. 25, 2001.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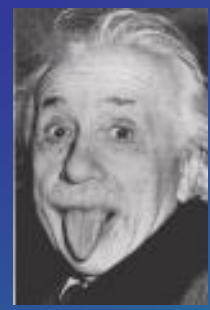
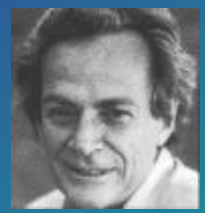
Peer-Reviewed Publications III

- Entering the Conversation:
  - Scientific writing serves scientists who are hooked on a particular story
  - Unique Cultural Situation
  - Think of Sit-Com Writers
    - Must know the characters
    - What they have said in the past
    - What sort of reasonable things they might say
    - What they are wondering
  - In some cases, stories written over several hundred years by a multitude of people





Writing in Science: a personal tale

redux

- The Science Fair Model, duh…
- The Observational Model, Wow!
- Common writing tasks for all scientists
- Proposal Writing Ins and Outs
- Journal Writing and Pitfalls
- Joining the conversation

Fin

- The Three T's
- Structuring your thinking
  - Writing for your audience
- Following the rules of grant writing
- Following the rules of writing for Journals/Proceedings
- Writing something that will *make a difference*