LETTERS

Cite This Letter!

The past decade has seen a decline in the value placed on the number of refereed publications as the premier measure of promotability of a person pursuing an academic career. There are probably several reasons for this change, not the least of which must be the glut of journals and papers that are being printed and the growing percentage of material that is read only by its referees before it is sent on its way toward oblivion.

To make a person's publication record more meaningful, increased use is made of the *Citation Index*, a publication intended to help assess the value rather than the number of a person's publications. In the *Citation Index* we can look up how often a paper of ours has been cited by anyone. Thus it seems timely to recall and summarize a few of the basic principles and rules that govern, or should govern, our practices of citing and acknowledging other people's work.

▷ First of all, we must remember that the primary purpose of publishing anything is for the author to be cited, and that the best way to get cited is to cite other people, no matter how trivial their work.

▷ It follows that there is little point in referencing anybody who will not reference you. With a few exceptions (see below) this automatically excludes the dead and the retired, no matter what they did for us. The people who need citations are those of us who still need promotions and merit raises.

▷ Another basic fact is that people read things not to see how brilliant the writer is but to see how brilliant the reader is. If we favor an author by reading his or her paper, the least we expect is to see our own work cited.

▷ Your list of references should show erudition and knowledge. In addition to the needed references from your immediate topic, it looks good to demonstrate familiarity with foreign literature. Add a couple of references written in German, French or Urdu, which has lately become about as important in science as French. A citation or two from a seemingly unrelated field, such as paleoethnomusicology, looks good if your work is in microbiology. It attests to the vastness of your intellectual range.

▷ Sometimes it looks good to throw in some obscure work by a scientific giant. Descartes and Newton are hard to do anymore, but the likes of Boltzmann, Tyndall or Poisson can still impress if used sparingly.

▷ Bear in mind that only the most shameless among us will actually contact an author and complain about not having been cited. Most of us keep quiet and simply return the favor. The failure to cite work whose authors think it should have been cited is a powerful source of enduring animosity.

▷ Only the most scholarly of us really want to read the old papers in which all the knowledge is developed that we are using to do our thing. This creates a niche for the review papers, which are intended to summarize the work of a decade or two and to relieve us from reading and citing all the original work. Reviews are among the most popular and frequently cited references, and some of their authors are still waiting for the arrival of their first original idea.

▷ If your paper is very good, consider citing none of your previous publications on the same subject, to suggest success on the first try.

▷ If some of your earlier publications turn out to have been somewhat off the mark, don't hesitate to ridicule them. Even ridicule is a form of citation, and after all, humility is one of the finest variations of expressing self-esteem.

▷ Most of our work, and all of our good work, is derived from something that someone else suggested, whether to us personally or in a publication. This fact must be concealed at all cost. Acknowledgments like "The idea to undertake this study was derived from a lecture by . . . " sound fawning if referring to a person who still has some influence over your career, and they are superfluous if directed at a dead or retired person who is not your father or the local lumberjack-philosopher.

▷ To further obscure the true object of your gratitude you should thank the people who calculated your numbers, typed your manuscripts and drew your figures. While most of us now do our own word processing and drafting, it is good to please our secre-

continued on page 109

LETTERS *(continued from page 15)*

taries, some of whom remember the times when they had to erase multiple copies of onionskin on their typewriters.
▷ Another good person to acknowledge is the civil servant who, being your servant and having acted in a civil fashion, approved the grant that allowed you to do the work.
▷ If you are ever tempted to write, for instance, "We owe special gratitude to the people who generated the goods and services and who paid the taxes that allowed us to live in modest comfort and to do the hard but gratifying work reported here," forget it. Everybody will think you have gone mushy.

The obvious conclusion from this recitation of prevailing principles and practices is that neither a list of publications nor the *Citation Index* provides a solid basis for judging the merit of a person's work and that a source of higher-order information must be sought. For instance, we might attach to each of our reprints an affidavit from the person who gave us the idea. These affidavits would not take much time to write, and they could simply say something like "I hereby certify that Dr. X's basic idea to undertake a study of . . . was derived from a conversation held with me on. . . ." This would give us an opportunity to suck up to some big-name folks, who usually have so many good ideas that they can't keep track of which one they gave to whom. Several agencies of the Federal government are in the process of developing the joint funding of a massive research project entitled Higher-Order Acknowledgment and Citation Study (HOACS).

NORBERT UNTERSTEINER
University of Washington
Seattle, Washington

Distant Supernovae Cast New Light on H_0 Value

Bertram Schwarzschild's recent news story (December, page 19) on new measurements of Cepheid-based distances to Virgo cluster galaxies with the Hubble Space Telescope ended by describing a major unresolved controversy about the cosmic distance scale: Two groups of astronomers have derived significantly different values of the Hubble constant H_0 from type-Ia supernovae. The controversy is particularly perplexing since both groups anchor their results on galaxies with well-determined Cepheid distances.

The story correctly notes that one side of this controversy maintains that "type-Ia supernovae are not in fact standard candles" and that while "type-Ia supernovae are not monoenergetic, one can deduce the intrinsic luminosity of any one explosion from the time dependence of its observed brightness." This is our position, and indeed these results are derived from our work. The reference given in the news story, however, is to a paper[1] presenting a different analytical method applied to a set of supernova data taken predominantly from our studies.

Our group from the Cerro Tololo Inter-American Observatory of the National Optical Astronomy Observatories and the Cerro Calán Observatory of the University of Chile has just finished a four-year survey of supernovae. The Calán–Tololo survey[2] has discovered 50 supernovae, of which 32 are type-Ia supernovae out to redshifts of approximately 0.10. Previous papers[3] based in part on the data taken during the Calán–Tololo survey have shown that type-Ia supernovae have a small, but real, variation in intrinsic luminosity that is closely correlated with properties in the light curve near maximum light. In our recent paper[4] presenting the results for a subsample of 13 type-Ia supernovae with well-established light curves, we find values of the Hubble constant between 62 and 67 km sec^{-1} Mpc^{-1}, with a typical error of 10 km sec^{-1} Mpc^{-1}.

The advantage of the distant supernova frame for measuring the Hubble constant is that local velocity inhomogeneities in the Hubble flow are relatively unimportant at large distances. The relative supernova distances are apparently accurate to better than 10%. The large error bars on H_0 represent, in part, the uncertainties due to the small number of galaxies (two) for which Cepheid distances have been measured and that have hosted type-Ia supernovae. As emphasized in the PHYSICS TODAY story, we can expect significant improvement in the calibrations of the "secondary yardsticks" from the anticipated HST studies by Wendy Freedman's group and Allan Sandage's group.

References

1. A. Riess, W. H. Press, R. Kirshner, Astrophys. J. Lett. **438**, L17 (1995).
2. M. Hamuy *et al.*, Astron. J. **106**, 2392 (1993).
3. M. M. Phillips, Astrophys. J. Lett. **413**, L105 (1993). J. Maza, M. Hamuy, M. M. Phillips, N. B. Suntzeff, R. Aviles, Astrophys. J. Lett. **424**, L107 (1994). N. B. Suntzeff, in *Supernovae and Supernova Remnants,* Int. Astron. Union Colloq. 145, R. McCray, Z. Wang, eds., Cambridge U. P., Cambridge, UK (1994), in press.
4. M. Hamuy, M. M. Phillips, J. Maza, N. B. Suntzeff, R. A. Schommer, R. Aviles, Astron. J. **109**, 1 (1995).

NICHOLAS B. SUNTZEFF
MARK M. PHILLIPS
MARIO HAMUY
ROBERT A. SCHOMMER
Cerro-Tololo Inter-American Observatory
La Serena, Chile
JOSÉ MAZA
University of Chile
Santiago, Chile

X-Ray Lasers: Half a Cavity's Better Than One

As a researcher who has worked on the physics of short-wavelength lasers for two decades, I found the news story on the demonstration of the collisionally pumped Ar^{8+} laser at 46.9 nm (October, page 19) very interesting. It constitutes a very good description of an achievement that excited the x-ray laser community earlier this year.

I would, however, like to make a brief comment on the section that discusses the use of multilayer mirrors in x-ray lasers, in particular the statement "Attempts to place mirrors around laser-pumped x-ray laser plasmas haven't been particularly successful: The mirrors were typically damaged after a single pulse, and in any case the conditions for significant gain didn't last long enough for the reflected radiation to be greatly amplified on the second or third pass." Not mentioned is the half-cavity configuration in which a spherical mirror is placed at one end of the plasma column, to allow a second pass through the medium. That technique has proven to be a very powerful tool in a number of laboratories. In 1991 a Mo:Si mirror employed in the half-cavity configuration boosted the output of a germanium laser at 23.6 nm by two orders of magnitude, resulting in saturation.[1] Moreover, double-passing the laser was seen to significantly improve the coherence.[2] In neon-like selenium at 20.6 and 20.9 nm, enhanced-efficiency saturation was obtained at Lawrence Livermore National Laboratory using a half-cavity arrangement.[3] Finally, at the Laboratoire de Spectroscopie Atomique et Ionique–Laboratoire d'Utilisation des Lasers Intenses we have recently[4] used a half-cavity arrangement to obtain an 80-fold intensity enhancement of the neon-like zinc laser at 21.2 nm. This latter device, pumped by only 400 joules, delivers 0.4 millijoules in a saturated x-ray beam, making this laser the most efficient demonstration of saturated x-ray operation to date.