Keeping Abreast of Quantum News:
Quantum Computing on the Web and in the Literature*

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This book covers many major developments in quantum computing, but the field is still young, and there will no doubt be many more developments in the future. These future developments will include research discoveries, of course, but they will also include trends in industry, surges in media coverage, and tides of public interest. This appendix describes tools that can help you track quantum developments of all kinds.

Keeping Abreast of Popular News

There are scores of newspapers, magazines, and other popular news sources, any one of which might run a story about the newest quantum development. How will you know if one does? You can keep an eye on your favorite news sources, but you will miss many stories that way. A better tactic is to use a news aggregator, such as Google News (http://news.google.com/), which allows you to search current and past stories from a multitude of news sources. You can add Google News to your stable of frequently visited sites, but the most efficient way to use it is to set up an alert or RSS feed and let the news come to you. After you perform a Google News search that yields good results, simply click "Alerts" to set up an alert that will notify you by e-mail of new stories that satisfy your search. Alternatively, click "RSS" to set up an RSS feed that will deliver those stories directly to your RSS reader.

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In addition to the mainstream news, blogs devoted to quantum topics can be excellent sources of information. In fact, a blog whose focus overlaps with your interests can serve as a compass for navigating quantum news. Because new blogs are started all the time and existing blogs are often left to languish, there is little point in recommending individual blogs. Use tools such as Technorati (http://www.technorati.com/) and Google Blog Search (http://blogsearch.google.com/) to search for blog posts of interest and to identify blogs worth reading regularly. Look for blogs that offer insightful analyses of news stories and easy-to-understand distillations of scientific discoveries.

Occasionally, you will need to step back from the news and brush up on background information. The best site for refreshers is Quantiki (http://www.quantiki.org/), a wiki with tutorials and encyclopedia-style articles about quantum information. As with all wikis, anyone can edit Quantiki entries, which means that anyone can (knowingly or unknowingly) insert errors, inconsistencies, and nonsense. So, although Quantiki is full of valid and valuable information, you cannot assume that everything written there is correct. In other words, Quantiki is a wonderful and informative site, but if you need to be absolutely certain of something, look it up somewhere else too. The same is true of the popular, omnidisciplinary Wikipedia (http://en.wikipedia.org/), which is pocked by errors and vandalism but nevertheless has some excellent entries on quantum computing.

Keeping Abreast of Scientific Literature

Are news articles, wiki entries, and blog posts sufficient to satisfy your curiosity? Or do you want to track a topic more closely and read about developments in researchers' own words? If the latter, familiarize yourself with one or more of the following tools for tracking the scholarly literature of quantum computing. (For tips on how to read scientific articles, see Appendix A.) The single best source for up-to-the-minute articles about quantum computing is arXiv (http://arxiv.org/), an online archive of hundreds of thousands of scientific articles. Among quantum computing researchers, there is a strong culture of sharing articles on arXiv as soon as they are completed, often months (sometimes years) before they are published in journals or conference proceedings.

There are several ways to use arXiv to stay current with quantum computing. You can periodically visit arXiv and search for articles relevant to your interests. Alternatively, you can browse recent additions to arXiv's quantum physics archive, quant-ph, which includes

quantum computing articles. If you prefer automatic notifications, you can sign up for arXiv's e-mail listing service or subscribe to the RSS feed of new quant-ph submissions.

Because articles on arXiv are posted by their authors, the articles have not been vetted by peer reviewers or cleaned up by editors. That said, arXiv has an endorsement system for authors, so there is some assurance that articles on arXiv are written by reliable researchers.

Posting to arXiv is voluntary, and some researchers do not, or do not always, post their articles. Thus, arXiv is not a comprehensive record of quantum computing research; indeed, no single resource is a comprehensive record of the field. That said, there exist databases that index all articles published in high-quality science journals. These databases are excellent aids to anyone who wants to systematically track research on a certain topic or focus on findings that have passed a stringent peer review process. The two biggest and best databases of this kind are Scopus and Web of Science, both extraordinarily expensive and therefore usually available only through academic libraries. If you have access to Scopus or Web of Science, you can periodically visit and perform searches, or you can perform a search once and then turn that search into an e-mail alert or RSS feed. If you are interested in multiple topics, you can set up multiple e-mail alerts or RSS feeds.

If you do not have access to either of these databases, your best option is Google Scholar (http://scholar.google.com/), a free Google tool for searching for journal articles and other kinds of scholarly literature. Google Scholar's coverage has gaps and its search features are not very sophisticated, but it is nevertheless remarkably powerful and delightfully easy to use.

Once you find out about an article, how do you find the article itself? Sometimes, the tool that makes you aware of the article's existence also leads you to the text of the article. For example, arXiv contains not just information about articles but also the articles themselves. But this is not always the case. For example, although Scopus and Web of Science contain a wealth of information about articles, they do not contain actual articles. In other words, they are indexing databases, not full-text databases. Meanwhile, Google Scholar is a hybrid: some results link to the full text of articles, some link to abstracts, and some are just citations with no links.

Luckily, many libraries subscribe to numerous full-text databases and employ tools that link from article citations to articles themselves. As a result, the full text of an article is often only a few clicks away from the article information in Scopus, Web of Science, or Google

Scholar. Of course, different libraries subscribe to different databases and choose different technologies for linking between databases; ask your librarian about the tools available to you. Also, keep in mind that most journals are available both electronically and in print. If your library does not have electronic access to the article you want, it might have a print copy; again, talk to your librarian about how to determine definitively whether or not your library has a certain article.

Inevitably, your library will not have every article you want—what then? Perhaps the article (or a version of it) is freely available on arXiv, the author's homepage, an institutional repository, or elsewhere. In general, a search of both Google and Google Scholar is sufficient to determine whether an article is freely available online. If you do not find the article but do find a publisher's page offering to sell you the article, do not pay! Rather, request the article through interlibrary loan, a free service at many libraries.

The Best Way to Stay Abreast?

No single tool is sufficient to keep you fully informed about quantum computing. Different tools have different strengths, and you should familiarize yourself with those that best satisfy your needs and curiosities. For example, if you are tracking a specific problem or technology, scientific articles are best. Furthermore, if you value seeing new research as soon as it is released, keep an eye on arXiv. If you are curious about which developments cause a stir and how they fit into scientific and social contexts, pay attention to popular news stories and quantum blogs.

If your interest in quantum computing is casual, stay abreast however and whenever suits you. But if quantum computing is your passion or specialty, read broadly. You never know what will excite your curiosity, provide an insight, or inspire a big idea.