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VIEWPOINT

The Deceptive Allure of Sci-Hub

OSA Executive Editor **Alison Taylor** and OSA Fellow **Joseph Izatt** offer a perspective on the world's largest illegal purveyor of scientific papers—and its potential to damage science.

OSA was founded 100 years ago to improve access to optical science and its results. That commitment, embodied in the very first issue of JOSA in January 1917, continued through the establishment, in 1997, of *Optics Express*, the first open-access (OA) journal in the physical sciences. It is manifest today in the array of 17 international journals, both subscription and OA, that the society supports. One of us, Joseph Izatt, was the founding editor of one of those OA journals, *Biomedical Optics Express*; the other, Alison Taylor, helped realize and advance OSA's newest OA effort, the highly selective *Optica*.

Given OSA's long-standing commitment to public access to research results, we have been closely watching other evolving initiatives—some that we view as positive, others that we believe threaten scientific publishing



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and, thus, communities like ours that it serves. One such “sharing” initiative, Sci-Hub—a rogue web site in Kazakhstan that hosts more than 50 million illegally

obtained scientific papers, ostensibly in the name of free access for all—raises particular concerns.

What Sci-Hub is—and isn't

Sci-Hub's technology is simple: it is essentially a web scraper, empowered by usernames and passwords for academic institutions' journal subscriptions that it obtains through various means. Some of the username/password combinations are said to have been "donated" to the site by academic researchers who are sympathetic to the cause; others, it's been suggested, have been garnered via more nefarious means, such as phishing. Either way, Sci-Hub has used those ill-gotten credentials to unlock publishers' web sites and build a vast archive of scientific article PDFs, which it makes available for free download.

The result is the world's most visible illegal clearinghouse for scientific papers—a sort of Pirate Bay of the scholarly literature. Indeed, the site's founder, Kazakh grad student Alexandra Elbakyan, wears the "pirate" label proudly. The popular press has portrayed her as a kind of Robin Hood, unshackling academic papers held captive by venal, avaricious scientific publishers, and making them available for all, especially in access-challenged developing nations.

The reality is, as always, more complicated. For starters, a recent investigation published in the 29 April 2016 issue of *Science* suggested that many of the site's downloads go to affluent academic hubs, in areas such as New York City and Silicon Valley, that are already well-served with institutional access to scientific journals. Ironically, traditional academic publishers and libraries have arguably provided far greater access to research in developing countries than Sci-Hub—by making content available through initiatives

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such as the International Network for the Availability of Scientific Publications and the eJournals Delivery Service of the International Centre for Theoretical Physics (OSA participates in both); through publication of a wide array of OA journals; through

interlibrary loans; and through other, entirely legal means.

Sci-Hub as a threat to professional societies

While many papers on Sci-Hub come from large commercial publishers, content published by professional scientific societies, including OSA, also appears there. This illegal channel undermines a society's ability to continue to generate income from its publishing program. For many societies, OSA included, publishing income contributes key support for the myriad educational, networking and development opportunities and activities that such organizations provide to their members and communities.

If material from OSA's subscription journals like *Optics Letters*, *Applied Optics* and *JOSA A* and *B* is stolen and

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Supporters of Sci-Hub may argue that the site benefits science by accelerating a global shift to open access. However, subscription journals like OSA's provide an outlet for interesting, high-quality, well-cited research without the need for authors to pay for the privilege of publication as they would in many OA journals. OSA's view is that it is important to offer our community a choice in where and how they publish. For that, both subscription and OA journals need to be supported and paid for.

Sci-Hub as a threat to researchers

It's not just publishers, society or otherwise, that are affected. The siphoning of downloads, for example, affects individuals interested in demonstrating the value of their research, whether to potential funders or promotion and tenure committees, because it means that accurate usage activity cannot be recorded. Publishers also maintain and curate the scientific record, tracking and alerting readers to subsequent errata or retractions, and linking comments and responses—services absent from a web scraper like Sci-Hub.

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Perhaps most frightening for individuals is that, by leaking login credentials to Sci-Hub, they may be compromising their own cybersecurity, and their institution's, in unexpected ways. As described by academic librarian Rick Anderson in a recent post on The Scholarly Kitchen, a popular publishing-industry blog (<http://ow.ly/u9Xt3021cU6>), the usernames and passwords that have been shared with (or phished by) Sci-Hub could provide significant access to confidential documents within your institution, with far-reaching consequences like identity theft.

What should researchers do?

We've tried to argue here that an illegal, destructive venture like Sci-Hub is not the path to follow in the quest to improve access to scientific research. Yet Sci-Hub is unlikely to go away any time soon. In the transnational "wild west" of the internet, the venture lies largely outside of the reach of conventional law. And even if some kind of legal action succeeded in shutting Sci-Hub down, history suggests that it, or something like it, would quickly pop up again at another IP address.

That means that the success of Sci-Hub—and its ability to wreak havoc on learned societies, the library community and other stakeholders in the scientific ecosystem—lies largely

in the hands of academic scientists. Given that, we strongly urge everyone who cares about that ecosystem, and its sustainability, to observe two simple rules regarding Sci-Hub:

Don't feed it. While this should be obvious in an age of cybercrime, it is foolish to provide any private username/password, whether your own or your institution's, to an unregulated, self-described pirate website doing business at an undisclosed location.

Don't use it. Arguably owing largely to the efforts of scholarly publishers and learned societies, access to scientific research has vastly increased in recent years, in all parts of the globe. But those very gains have also increased the frustration of *not* being able to find the full text of exactly the paper you want, exactly when you want it.

Even so—and even amid the pressure of their own research efforts—we believe that, for the good of the scientific community, researchers must resist the temptation to sneak anonymously through an illegal portal such as Sci-Hub. Instead, the next time you feel that pull, we suggest that you do what researchers have done for decades: if you can't get the paper directly from the publisher's website (through your own subscription or your institution's), then drop an e-mail to the paper's author. We suspect that he or she will be happy (as most publisher-author agreements freely allow) to send you a copy. **OPN**

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[Note: Stewart Wills, OPN's editor and content director, contributed to the research and preparation of this Viewpoint.]