



Library Report: Physics

Cyclical Program Review 2020

- Nanoscience (BSc)
- Physics (BSc, MSc, PhD)
- Theoretical Physics (BSc)

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Summary

The library provides **good** support for the Physics programs:

- Biological and Medical Physics (BSc)
- Nanoscience (BSc)
- Physics (BSc, MSc, PhD)
- Theoretical Physics (BSc)

Recommendation

Consider integrating information literacy skills into the programs, potentially in:

- PHYS*2180, PHYS*3510, and IPS*3000 for Physics, Theoretical Physics, and Biological & Medical Physics programs
- NANO*1000, NANO*2000, and NANO*3200 for the Nanoscience program

Librarians are not currently involved in any of the required courses or restricted electives in the programs being reviewed but are available to work with curriculum committees to identify key courses. In our experience, this is effective for students, ensuring that they gradually improve their proficiency in engaging with the literature.

Part 1: Collections

Overall, the library provides **good collections support**.

Due to the interdisciplinary nature of Physics, and the strength of other programs in the physical, engineering, environmental, and life sciences, access to the broad literature relevant to Physics students at Guelph is strong. E-journal and index coverage is excellent. Library participation in national and provincial purchasing consortia results in better collections than would be expected at comparable, less well-connected institutions. The library's membership in the *Sponsoring Consortium for Open Access Publishing in Particle Physics* (SCOAP³) enhances access to the particle physics literature. The acquisition of e-books is rapidly replacing print, facilitating convenient remote desktop access.

The greatest challenge that Physics presents for library collections is the very high cost of medical information resources, and STEM journals more generally. Some gaps exist in access to the literature pertaining to Astronomy & Astrophysics, Optics, Geophysics, and Materials Science. As funds and priorities permit, additional subscriptions from publishers such as the Society for Photo-Optical Instrumentation Engineers (SPIE), American Geophysical Union (AGU), and Nature will be acquired.

Journals

The library almost exclusively acquires online journals, providing access to more than 55,000 titles across all disciplines.

The collection relevant to Physics is strong, and students can access nearly complete journal suites, in many cases back to the first volume, from publishers such as:

- American Chemical Society (ACS)
- American Institute of Physics (AIP)
- American Physical Society (APS)
- Annual Reviews
- Canadian Science Publishing
- Elsevier
- IEEE
- Institute of Physics (IOP)
- Nature journals (select titles)
- Oxford University Press
- Royal Society of Chemistry (RSC)
- Society for Industrial & Applied Math (SIAM)
- Springer
- Taylor & Francis
- Wiley

Where gaps exist, it is generally for publishers to which the library subscribes to select titles rather than complete ‘bundles.’ Notable publishers in this category include the American Geophysical Union, Nature (e.g. *Nature Astronomy*; *Nature Reviews Materials*), SPIE, and World Scientific. The library adds new subscriptions in response to evolving demand and as budgets permit.

The university has access to most of the high impact factor journals relevant to Physics, according to Clarivate’s *Journal Citation Reports (JCR)* database (2018).

Table 1. # journal titles to which U of G has access	
JCR Subject Category	Guelph Access
Acoustics	21/25
Applied Physics	24/25
Astronomy & Astrophysics	23/25
Atomic, Molec. & Chemical Physics	25/25
Biophysics	25/25
Condensed Matter Physics	25/25
Geochemistry & Geophysics	22/25
Instruments & Instrumentation	24/25
Materials Science	23/25
Mathematical Physics	20/25
Mathematics, Applied	23/25
Mathematics, Interdisciplinary	23/25
Mechanics	25/25
Multidisciplinary Physics	25/25
Nanoscience & Nanotechnology	24/25
Nuclear Physics	16/19
Nuclear Science & Technology	24/25
Optics	22/25
Particle Physics	21/25
Physics of Fluids & Plasmas	24/25
Radiology, Nuclear Med. & Imaging	22/25
Thermodynamics	25/25

Books and E-Books

The acquisition of e-books is rapidly replacing print, facilitating convenient remote access. The library offers a broad collection of books and e-books in many disciplines from such major academic publishers as:

- American Chemical Society (ACS)
- CRC Press
- Elsevier
- Institute of Physics (IOP)
- Morgan & Claypool Synthesis Lectures
- Oxford University Press
- Royal Society of Chemistry (RSC)
- Springer
- Taylor & Francis
- Wiley

Search Tools to Access the Literature

- Omni is an academic search tool (catalogue) which provides access to resources from 14 Ontario university libraries. It permits searching a shared collection, including books, databases, journal articles, videos, music, and more. Omni facilitates access to full-text by linking to library-subscribed and Open Access scholarly works.
- Access to the literature is available by searching library journal databases including:
 - Analytical Abstracts
 - Engineering Village
 - IEEEExplore
 - INSPEC
 - MathSciNet
 - SciFinder
 - Web of Science

Research Methods & Protocols

Journals dominate the research literature. However, methods and protocols are often impossible to replicate from the brief descriptions written up in research articles. To help overcome this challenge, the library collects an increasing number of books, book series, and databases that provide comprehensive detail about experimental procedures. Notable examples include:

- Springer-Nature Experiments (formerly *Springer Protocols* and *Nature Protocols*)
- Wiley Current Protocols

Multimedia resources

Audio, DVD, and streaming video that explore issues related to physics are selected individually or as part of standing subscriptions. The library subscribes to several streaming media services that provide films and film clips that could enhance learning in Physics, including:

- Docuseek 2
- Films on Demand: Digital Education Video
- Kanopy
- PBS Video Collection

Course Reserves / Textbooks

To support courses, the library provides:

- Textbooks – since 2017 library has purchased at least 1 print copy of every required textbook for each undergraduate course (and online where possible) with the goal of mitigating high costs for students
- Course reserves - accessible, copyright-compliant links to readings

Part 2: Academic and Professional Skills

SLG's (Supported Learning Groups)

Weekly student-led study groups help students taking historically challenging courses to:

- Meet students from the class in a small group format
- Test their knowledge prior to tests and exams
- Leave with something tangible to review later

SLG participation data is gathered for each course - but does not collect students' major or program. Table 1 reports the aggregate data and is not limited to Physics students.

Table 2. SLG Participants 2018-19		
Course	# of sign-ins (indicating attendance)	# of unique students
BIOL 1090	591	284
CHEM 1040	1292	421
CHEM 1050	832	221
BIOC 2580	560	204
BIOC 3560	283	107
MBG 2040	261	102
MCB 2050	674	227

Research and Information Literacy (IL) Skills

Information Literacy (IL) librarians prioritize support to large, required, and core courses that have research skills or digital media literacy assignments or components. IL librarians aim to scaffold their information literacy instruction throughout the required curriculum for all undergraduate programs, providing students with the opportunity to build on their skills year over year. Options for supporting students include:

- guest lectures
- customized digital learning objects, such as online course guides
- one-on-one or small group consultations with librarians
- Literature review (including Systematic reviews) support

Librarians are not currently involved in any of the required courses or restricted electives in the programs being reviewed. Courses that librarians have identified for possible support include PHYS*2180, PHYS*3510, and IPS*3000 for the Physics, Theoretical Physics, and Biological & Medical Physics programs; and NANO*1000, NANO*2000, and NANO*3200 for the Nanoscience program. Students in capstone courses, such as PHYS*4001/2 and NANO*4910, and those who are conducting research projects may benefit from IL librarian support, whether through an in-class librarian visit or a one-on-one consultation. IL librarians would welcome an opportunity to discuss how best to provide research skills support to these courses and students.

Media Skills

- digital media creation skills, such as digital storytelling, podcasting, creating infographics, and animated videos

Table 3. Media Workshops 2018-19			
Course	Type of Session	# sessions	# students
IPS 3000 – Science Communication	Introduction to scripting + storyboarding	1	18
IPS 3000 – Science Communication	Introduction to Audacity	1	18
IPS 3000 – Science Communication	Intro to Animated Videos	1	18
IPS 3000 – Science Communication	Intro to Digital Storytelling	1	18
PHYS 1080 – Physics for life sciences	Exam Review live stream	1	185 viewers connected

Online Learning Resources

The learning, research, and writing staff in the library have developed more than 200 guides tailored to students' needs.

Most Viewed (aggregate use; not limited to Physics students)

Topic Guides

- Cite Your Sources: APA, 40,502 views
- Write a Literature Review, 18,797 views
- Write a Close Reading, 10,722 views
- Find Video Collections, 8,534 views
- Cite Your Sources: Chicago Notes & Bibliography, 8,126 views
- Cite Your Sources: MLA, 8,107 views
- Study Effectively, 7,011 views
- Succeed at Exams, 6,345 views
- Edit Video: Shotcut, 5,150 views
- Find Mental Health Resources, 5,305 views

Videos

- How to Create a Concept Map, 120,217 views
- What is a t-test?, 20,034 views
- Understanding and Avoiding Plagiarism: Types of Plagiarism, 7,763 views
- How to Read an Article, 7,324 views
- Cite Your Sources: When / Why Cite, 5,002 views

Handouts

- Study Smarter Not Harder, 771 views
- Template for Writing Thesis Statements, 244 views
- 5 Types of Thesis Statements, 243 views
- Presentation Planning 101, 133 views
- Dealing with Group Conflict, 130 views

Electronic Theses and Dissertations (ETD)

Added to the Atrium, University of Guelph's repository (2018-2019):

- Physics – MSc = 11, PhD = 4