

Module 3: Copyright

Copyright in Physics

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(*) Action: C = Creation, I = Insert, U = Update, R = Replace, D = Delete

REFERENCED DOCUMENTS

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2		

APPLICABLE DOCUMENTS

ID	Reference	Title
1		
2		

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1. Copyright in Physics

1.1 Learning Outcomes

This module and the lesson plan that accompanies it aim to introduce the key concepts of copyrights and, particularly, its application in the field of Physics. By copyright, we are referring to the legal exclusive right of the creator of a certain original work (e.g., scientific work) to use and reproduce his creation. So, this creation is an intellectual property of his author and copyright protects it to be reproduced by other person without the author's authorization. Through the application of the copyright law, the creator of an original work owns the exclusive right to use and reproduce his original work for an established period of time¹.

After completing this module, you will be able to:

- Understand the key concepts of copyright law and its application within the field of Physics
- Identify the importance of the copyright law in the field of Physics
- Cooperate with your peers to apply and discuss the copyright law in a practical situation
- Improve your problem solving and critical thinking skills

Estimated seat time: 1 hour

1.2 Main Content

1.2.1 Terms and Definitions

The creation of an original work (e.g., scientific invention, scientific theory, or scientific paper) turns this work into intellectual property. Thus, this work becomes automatically protected by copyright, which means that the author of the intellectual property owns the exclusive right of using and reproducing his own work for an established period of time, that may vary according to the country where the work was produced².

¹ <https://www.investopedia.com/terms/c/copyright.asp>

² https://europa.eu/youreurope/business/running-business/intellectual-property/copyright/index_en.htm

In EU countries, the established period for copyright protection is 70 years after the author's (when the work is authored by a single author) or the last surviving author (when the work is authored by multiple authors) death². In countries outside the EU that signed the Berne Convention³, although this established period may vary, the intellectual property is usually protected for at least 50 years after the author's death. After this established time, the work becomes public domain.

The copyright protection is automatic, which means that an original work becomes automatically protected since the moment of its creation, with no need of the author to apply to a formal process. In order to notice other people regarding the work's authorship, the author may include a copyright notice to their work, in addition to his name and the year of creation. This copyright notice may include a text (e.g., "*all rights reserved*") or a symbol (©)².

Copyright assures economic and moral exclusive rights to the authors. Regarding economic rights, copyright assures that the authors control their work and are reimbursed for selling or licensing. On their turn, moral rights comprise the right of the authors claiming authorship and not accepting changes on the original work².

1.2.2 Theory behind the IP implementation

Although the application of copyright protection being clear in different fields, in the field of science, and particularly Physics works (e.g., Relativity theory, Velocity theory, Electroweak theory), it presents some ambiguity and limitations. In fact, over the years some limitations have been identified in the protection of scientific literature or scientific theories by copyright law, with patents being referred as the main source of protecting this kind of scientific work. In fact, when it comes to scientific literature, the copyright protection was usually limited to the authors' expression of results and not to the authors' ideas⁴.

Particularly, the copyright protection of scientific theories, applies specifically to the author's description or expression of the theory in their publications, for example, and not to the theory's equations, ideas, hypotheses, or models, which means that the scientific theories may be used, tested, reproduced and altered by other people without the author's permission. Exceptions only made when it comes to scientific theories eligible to trade secret protection (e.g., with a clear competitive advantage to the market)⁵.

³ <https://www.wipo.int/export/sites/www/treaties/en/documents/pdf/berne.pdf>

⁴ Reichman, J. H., & Okediji, R. L. (2012). When copyright law and science collide: empowering digitally integrated research methods on a global scale. *Minnesota Law Review*, 96(4), 1362-1480.

⁵ Byron, T. M. (2017). *On Copyright and Scientific Theory*, 34 Santa Clara High Tech. L.J. 1. Available at: <http://digitalcommons.law.scu.edu/chtj/vol34/iss1/3>

Although not protecting the ideas themselves, copyright law protects tangible work where researchers present their ideas, such as published scientific papers, technical drawings, structures' designs, or derivative works. This means that a scientific book or scientific a paper is covered by the copyright law⁶.

Usually, when a author publishes his work in a scientific journal in the subscription mode, he usually transfers the copyrights to the publisher, which means that the publisher owns the exclusive right of reproducing and sharing the paper. In the recent years, the option of publishing in Open Access has been reaching greater expression. Open Access means that the author maintains the copyrights of his own work and has the right to share and reproduce it⁷.

1.2.3 Practical examples

When a researcher in Physics creates a work, he may want to publish it in a scientific journal in order to maximize the impact of his/her work. When publishing a paper, the author usually signs a publishment agreement with the publisher. If the paper is published in a subscription mode (e.g., readers need to subscribe the journal in order to have access to the paper), the author usually transfers the copyrights to the publisher, meaning that the publisher owns the exclusive rights of that work. When the paper is published in Open Access (e.g., readers have free and open access to the paper), the author retains the copyrights of his/her work and license their rights to the publisher and readers⁷.





Creative Commons licenses are common and widely used example of licenses used to define the rights of readers to re-use and share the article. By defining a Creative Commons license, copyright owners are assuring that readers can only use that certain work according to what is authorized. These licenses have different levels of restrictions, and may vary from restricting all rights to authorizing the use of the work in compliance with the terms and restrictions. However, regardless the license selected by the copyright owner, all of them always require that the readers cite appropriately the author and source when referring to the paper⁸.

⁶ <https://www.wur.nl/en/Library/Researchers/Publishing/Copyright-in-research.htm>

⁷ <https://www.enago.com/academy/does-copyright-transfer-hinder-scientific-progress/>

⁸ <https://copyright.ubc.ca/creative-commons/>

Specifically, the Creative Commons license presents four restrictions. Copyright owners may wish to use one restriction or different combinations of restrictions, depending on its objectives. The four restrictions are summarized in the table below^{9,10,11,12}:

Condition	Image	Definition
Attribution		You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
Non-Commercial		You may not use the material for commercial purposes.
Share Alike		You must distribute your contributions under the same license as the original.
No Derivatives		You may not modify the work (e.g. translations, edited edition etc.)

Sources: <https://copyright.ubc.ca/creative-commons/>; <https://creativecommons.org/licenses/by/4.0/>







Based on the use of these four restrictions, there are six different licenses that copyright owners may apply to their work, from the most to the least restrictive. The six licenses can be summarized in the following table:

⁹ Creative Commons Attribution 4.0 International License <http://creativecommons.org/licenses/by/4.0/>

¹⁰ Creative Commons Attribution-Non-Commercial 4.0 International. License <https://creativecommons.org/licenses/by-nc/4.0/>

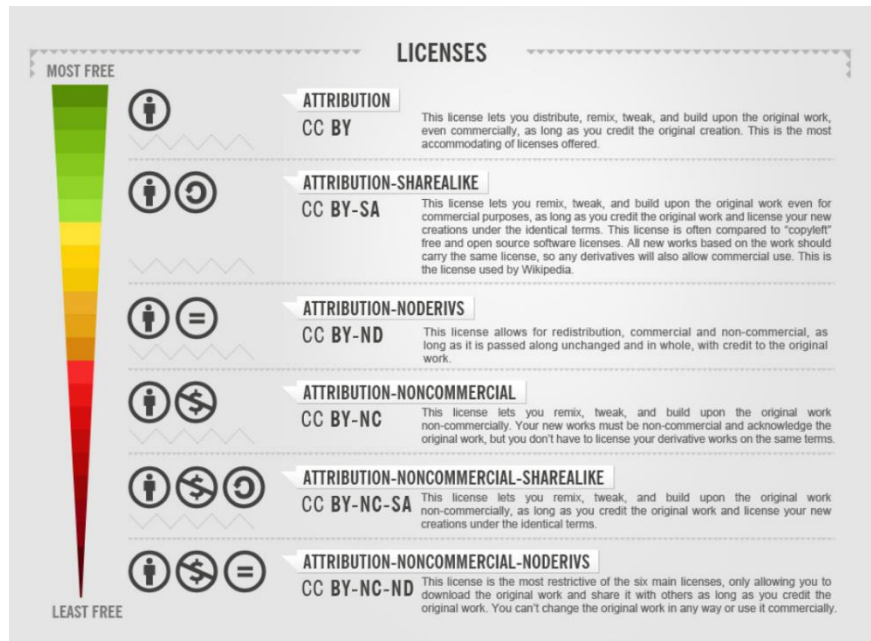
¹¹ Creative Commons Attribution-NoDerivatives 4.0 International. License <http://creativecommons.org/licenses/by-nd/4.0/>

¹² Creative Commons Attribution-NonCommercial 4.0 International. License <http://creativecommons.org/licenses/by-nc/4.0/>

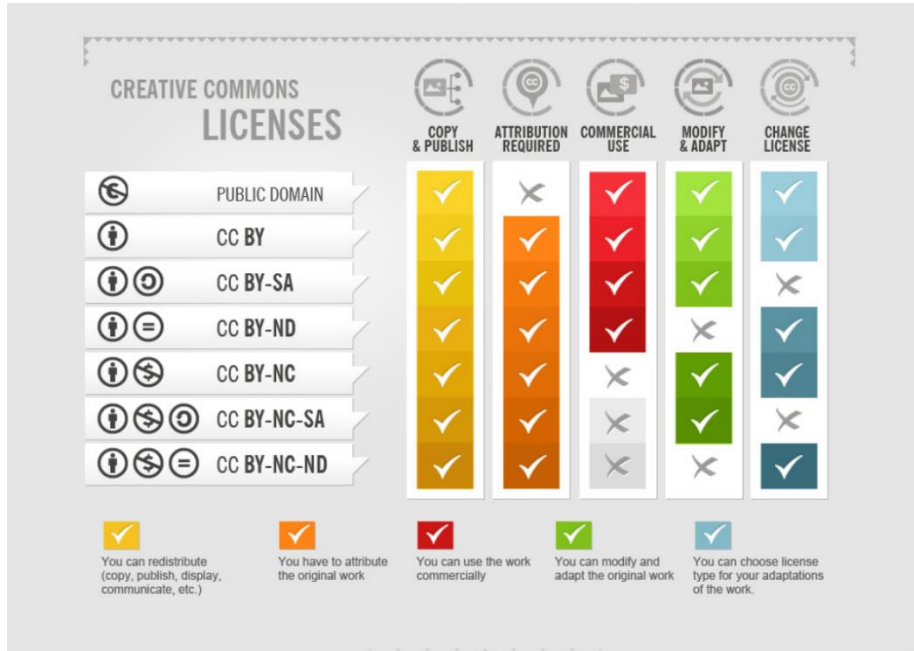
Title	Image	Description
Attribution CC BY		This license lets others distribute, remix, tweak, and build upon the work, even commercially, as long as they credit the creator for the original creation. This is the most flexible and accommodating of the available Creative Commons licenses. Recommended for maximum dissemination and use of licensed materials.
Attribution-NoDerivs CC BY-ND		This license allows for redistribution, commercial and non-commercial, as long as the licensed work is passed along unchanged and in whole, with credit to the creator.
Attribution-NonCommercial CC BY-NC		This license lets others remix, tweak, and build upon the work non-commercially, and although their new works must also acknowledge the creator and be non-commercial, they don't have to license their derivative works on the same terms.
Attribution-ShareAlike CC BY-SA		This license lets others remix, tweak, and build upon the work even for commercial purposes, as long as they credit the creator and license all new creations under the identical terms. This license is often compared to "copyleft" free and open source software licenses. All new works based on yours will carry the same license, so any derivatives will also allow commercial use. This is the license used by Wikipedia, and is recommended for materials that would benefit from incorporating content from Wikipedia and similarly licensed projects.
Attribution-NonCommercial-ShareAlike CC BY-NC-SA		This license lets others remix, tweak, and build upon your work non-commercially, as long as they credit the creator and license their new creations under the identical terms.
Attribution-NonCommercial-NoDerivs CC BY-NC-ND		This license is the most restrictive of the six main licenses, only allowing others to download your works and share them with others as long as they credit the creator, but they can't change them in any way or use them commercially.

Sources: <https://copyright.ubc.ca/creative-commons/>; <https://creativecommons.org/licenses/by/4.0/>

The following image provides a clearer picture of the six different licenses in terms of their level of restrictions:



Source: <https://foter.com/blog/how-to-attribute-creative-commons-photos/>



CREATIVE COMMONS LICENSES

	COPY & PUBLISH	ATTRIBUTION REQUIRED	COMMERCIAL USE	MODIFY & ADAPT	CHANGE LICENSE
PUBLIC DOMAIN	✓	✗	✓	✓	✓
CC BY	✓	✓	✓	✓	✓
CC BY-SA	✓	✓	✓	✓	✗
CC BY-ND	✓	✓	✗	✗	✓
CC BY-NC	✓	✓	✗	✓	✓
CC BY-NC-SA	✓	✓	✗	✓	✗
CC BY-NC-ND	✓	✓	✗	✗	✓

You can redistribute (copy, publish, display, communicate, etc.)
 You have to attribute the original work
 You can use the work commercially
 You can modify and adapt the original work
 You can choose license type for your adaptations of the work.

Source: <https://foter.com/blog/how-to-attribute-creative-commons-photos/>

1.2.4 Case studies

When a reader use someone else’s work without citing the original author, he/she is infringing the copyright law and committing plagiarism. For example in medical scientific research works, the most common types of plagiarism documented in the literature include¹³:

- **Plagiarism of ideas:** this type of plagiarism occurs when someone uses the unpublished ideas of others on his/her own. This may the form of plagiarism most difficult to detect.
- **Plagiarism of text:** this type of plagiarism occurs when someone uses a copied text/paragraph from a source on his/her own.
- **Self-plagiarism:** this type of plagiarism occurs when someone uses his/her own previous work in a further work without referencing the first one.
- **Collusion:** this type of plagiarism occurs when someone asks a third party to write a work and then uses as his/her own without referencing the original author.

¹³ Mohammed, R. A., Shaaban, O. M., Mahran, D. G., Attellawy, H. N., Makhlof, A., & Albasri, A. (2015). Plagiarism in medical scientific research. *Journal of Taibah University Medical Sciences*, 10(1), 6-11. Doi: <http://dx.doi.org/10.1016/j.jtumed.2015.01.007>

- **Patchwriting:** this type of plagiarism occurs when someone combines parts of different works and rearrange them in order to use it on his/her own without referencing the original authors.

Table 1: Forms of Plagiarism.

Form	Description
Plagiarism of ideas	Theft of a new idea or a theory presented anywhere. The plagiarist then conducts research based on this idea/theory and presents it as if it is his/her own without acknowledgment of the source.
Plagiarism of text	This form is also known as “copy-cut-paste” or “word-to-word” writing. This occurs when a researcher takes an entire paragraph from another source and includes it in his own research writing.
Self-plagiarism	This occurs when a researcher uses substantial parts of his research in two different publications using the same findings or illustrations without referring to it.
Collusion	Asking someone else to write a piece of work for the plagiarist who then presents it as if it’s his own.
Patchwriting	Copying parts of another work and changing a few words or the order of words to make it appear as if it is original.

Source: Mohammed et al. (2015)

1.3 Knowledge Assessment

Question 1: The creator of an original scientific work has the exclusive right to use and reproduce his/her work.

[True] [False]

Question 2: To own the exclusive right to use and reproduce his/her work the author needs to apply to a formal process

[True] **[False]**

Question 3: In EU countries, the established period for copyright protection is 70 years after the author’s death.

[True] [False]

Question 4: The copyright protection of scientific theories applies to the theory's equations, ideas, hypotheses, and models.

[True] **[False]**

Question 5: Usually, when a author publishes his/her work in a subscription mode of a scientific journal, who owns the copyrights of the publication?

[The publisher] [The author] [The readers]

Question 6 (multiple answers correct): Usually, when a author publishes his/her work in an open access mode of a scientific journal, who owns the copyrights of the publication?

[The publisher] **[The author]** [The readers]

Question 7: If the author uses the Creative Commons Attribution license, the readers do not need to cite the authors of the work when using it.

[True] **[False]**

Question 8: Match the terms with their definitions.

Attribution: You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use

Non-commercial: You may not use the material for commercial purposes.

Share-Alike: You must distribute your contributions under the same license as the original.

No Derivatives: You may not modify the work (e.g., translations, edited edition, etc.)

Question 9: Which of the following comprises the most restrictive license?

[Attribution-NonCommercial-NoDerivs] [Attribution-NoDerivs] [Attribution-NonCommercial-ShareAlike]

Question 10: Match the problems with their solutions.

Plagiarism of ideas: using the unpublished ideas of others on his/her own.

Plagiarism of text: using a copied text/paragraph from a source on his/her own.

Self-plagiarism: using his/her own previous work in a further work without referencing the first one.

Collusion: asking a third party to write a work and then uses as his/her own without referencing the original author.

Patchwriting: combining parts of different works and rearrange them in order to use it on his/her own without referencing the original authors.

1.4 Skills Assessment

Critical thinking and problem solving skills: In the proposed exercise for the lesson plan that accompanies this module “*The storytellers*”, the students are invited to develop their critical thinking by evaluating potential solutions for a given dilemma. Then, the class is also asked to find a solution to this dilemma that complies with the copyright law, thus promoting their problem solving skills.

2. References

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- Creative Commons Attribution-NoDerivatives 4.0 International. License
<http://creativecommons.org/licenses/by-nd/4.0/>
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<https://creativecommons.org/licenses/by-nc/4.0/>
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<http://creativecommons.org/licenses/by-nc/4.0/>
- <https://copyright.ubc.ca/creative-commons/>
- https://europa.eu/youreurope/business/running-business/intellectual-property/copyright/index_en.htm
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