

May 2024

Copyright & Creative Commons Licences

Dr. Lothar Nunnenmacher, Lib4RI





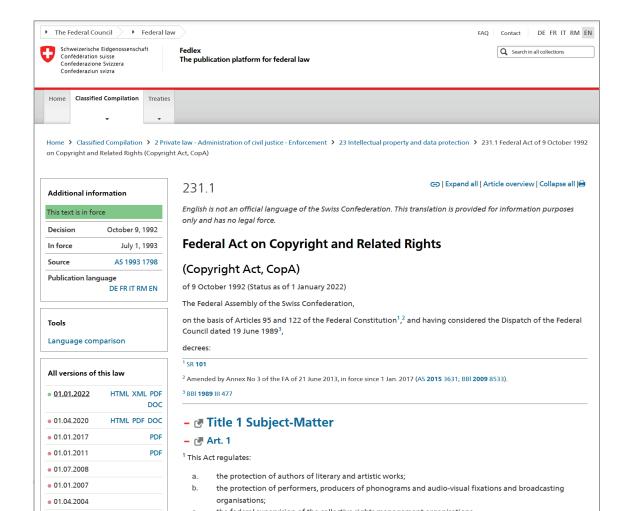


Copyright





https://fedlex.data.admin.ch/eli/cc/1993/1798 1798 1798



The Berne Convention, an international agreement governing copyright, was signed in 1886

- o slow uptake
- several revisions
- o now: 180+ contractors





Chapter 1: Works

Art. 2 Definition of works

- Works are literary and artistic intellectual creations with an individual character, irrespective of their value or purpose.
- ² They include, in particular:
 - a. literary, scientific and other linguistic works;
 - b. musical works and other acoustic works;
 - c. works of art, in particular paintings, sculptures and graphic works;
 - d. works with scientific or technical content such as **drawings**, **plans**, **maps** or three-dimensional representations;
 - e. works of architecture;
 - f. works of applied art;
 - g. photographic, cinematographic and other visual or audiovisual works;
 - h. choreographic works and works of mime.
- 3 Computer programs are also works.
- ⁴ **Drafts, titles and parts of works**, insofar as they are intellectual creations with an individual character, are also protected.

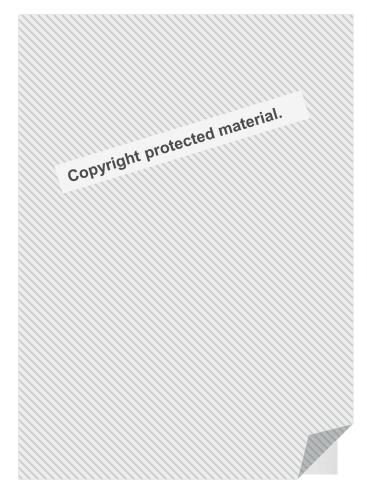
<=> Patents

A patent gives its owner the right to exclude others from making, using, selling, and importing an invention for a limited period of time, usually twenty years.

(Wikipedia)



What do you think: Which of the following photographs is protected by Swiss copyright law?





Bob Marley

Photograph: Max Messerli



London, Towerbridge

Photograph: Lothar Nunnenmacher

Hug G, 2005: Bob Marley vs Christoph Meili: ein Schnappschuss. Sic-online 9(1): 078, https://www.sic-online.ch/fileadmin/user_upload/Sic-Online/2005/documents/057.pdf.

Since 1. April 2020: Photographic depictions and depictions of three-dimensional objects produced by a process similar to that of photography are considered works, even if they do not have individual character.

Christoph Meili

Photograph: Gisela Blau May 2024 5



Chapter 2: Author

Art. 6 Definition

The author is the natural person who has created the work.

Art. 7 Joint authorship

Where **two or more persons** have contributed as authors to the creation of a work, copyright belongs to all such persons jointly. (...)

US Copyright Law

(Exceptions)

105. Subject matter of copyright: United States
Government works

Copyright protection under this title is not available for any work of the United States Government, (...)

201. Ownership of copyright

(b) In the case of a work made for hire, the employer or other person for whom the work was prepared is considered the author for purposes of this title, and, unless the parties have expressly agreed otherwise in a written instrument signed by them, owns all of the rights comprised in the copyright.

(i)



Chapter 3: Scope of Copyright

Art. 9 Recognition of authorship

- ¹ The author has the exclusive right to his own work and the right to recognition of his authorship.
- ² The author has the exclusive right to decide whether, when, how and under what author's designation his own work is **published** for the first time. (...)

Art. 10 Use of the work

¹ The author has the exclusive right to decide whether, when and how his work is **used**. (...)

Art. 11 Integrity of the work

- ¹ The author has the exclusive right to decide:
 - a. whether, when and how the work may be altered;
 - b. whether, when and how the work may be used to create a derivative work or may be included in a collected work.
- ² Even where a third party is authorised by contract or law to alter the work or to use it to create a derivative work, the author may oppose any distortion of the work that is a violation of his personal rights.
- ³ It is permissible to use existing works for the creation of parodies or other comparable variations on the work.

(a)



What do you think: How long is a work protected by Swiss copyright law?

- o 2 years
- o 20 years
- o 70 years
- o 70 years after the death of the creator
- o for unlimited time

(i)

May 2024



Chapter 6: Term of Protection

Art. 29 In general

- ¹ A work is protected by copyright as soon as it is created, irrespective of whether it has been fixed on a physical medium.
- ² Protection expires:
 - a. in the case of computer programs, 50 years after the death of the author;
 - b. in the case of all other works, 70 years after the death of the author.
- Where it is has to be assumed that the author has been dead for more than 50 or 70 years respectively, protection no longer applies.

Afterwards



If unclear

Orphan works





Exceptions to Copyright





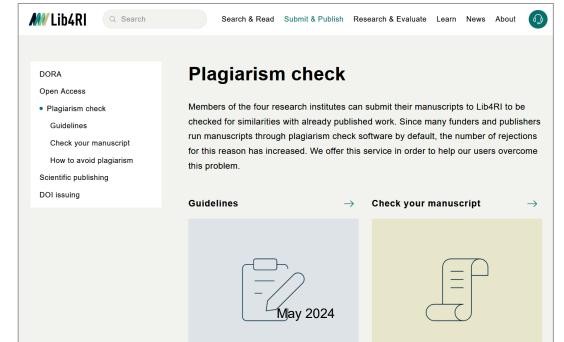
Chapter 5: Exceptions to Copyright

Art. 25 Quotations

- ¹ Published works **may be quoted** if the quotation serves as an explanation, a reference or an illustration, and the extent of the quotation is justified for such purpose.
- The quotation must be designated as such and the source given. Where the source indicates the name of the author, the name must also be cited.

Hot Topic: ChatGPT

see also: our web page on LLMs & Al tools



Copyright & CC licences



Chapter 5: Exceptions to Copyright

Art. 19 Private use

- ¹ Published works may be used for private use. Private use means:
 - a. any personal use of a work or use within a circle of persons closely connected to each other, such as relatives or friends;
 - any use of a work by a teacher and his class for educational purposes;
 - c. the copying of a work in enterprises, public administrations, institutions, commissions and similar bodies for internal information or documentation.
- Persons entitled to make copies of a work for private use may also have them made by third parties subject to paragraph 3; libraries, other public institutions (...)
- The following are not permitted outside the private sphere defined in paragraph 1 letter a
 - a. the complete or substantial copying of a work obtainable commercially; (...)

US Copyright Law

Chapter 1: Subject Matter and Scope of Copyright

107. Limitations on exclusive rights: Fair use

(...) the fair use of a copyrighted work, (...) for purposes such as **criticism**, **comment**, **news reporting**, **teaching** (including multiple copies for classroom use), **scholarship**, **or research**, is not an infringement of copyright.

In determining whether the use made of a work in any particular case is a fair use the **factors** to be considered shall include

- (1) the **purpose and character of the use**, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- (2) the nature of the copyrighted work;
- (3) the amount and substantiality of **the portion used** in relation to the copyrighted work as a whole; and
- (4) the **effect** of the use **upon the potential market** for or value of the copyrighted work.

Copyright & CC licences May 2024 © (1) 12



According to Swiss copyright law, which of the following «works» are you allowed to share with a colleague?

- o a journal article, authored by yourself
- o any journal article
- o a book chapter
- o a complete book, commercially available
- o none of them





Chapter 5: Exceptions to Copyright

Art. 20 Remuneration for private use

- 2 (...) Any person who reproduces works in any manner for private use under Article 19 paragraph 1 letter b or letter c, (...) owes remuneration to the author.
- Claims for remuneration may only be asserted by the authorised collective rights management organisations.

Copyright collecting societies in Switzerland

- SUISA music
- Suissimage audio-visual works
- SSA (Société Suisse des Auteurs) dramatic works
 and audio-visual works
- ProLitteris literature, photographs and arts
- SWISSPERFORM related rights



Dokumente

EAO

Suche 🔎

Sprache

Urheber, Verlage:

Urheber, Verlage

Registrierung bei ProLitteris

Wissenschaftlerin, Schriftsteller, Künstlerin, Illustrator? Vertreten Sie einen Verlag?

Verteilung der Vergütungen

Generalversammlung

ProLitteris ist in der Schweiz und in Liechtenstein für die Verwertung bestimmter Rechte zuständig (Texte und Bilder).

Publizieren Sie Texte oder Bilder, als Journalistin, Fotograf,



Chapter 5: Exceptions to Copyright

Art. 24d Use of works for the purposes of scientific research

- ¹ For the purposes of scientific research, it is permissible to reproduce a work if the copying is due to the use of a technical process and if the works to be copied can be lawfully accessed.
- ² On conclusion of the scientific research, the copies made in accordance with this article may be retained for archiving and backup purposes.
- ³ This article does not apply to the copying of computer programs.

More information to come:

15

Text & Data Mining

Copyright & CC licences

May 2024

© (1)



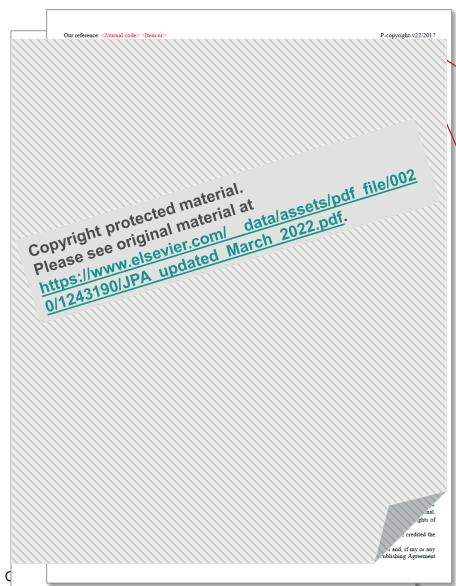


Copyright Transfer Agreements





Journal Publishing Agreement – Elsevier



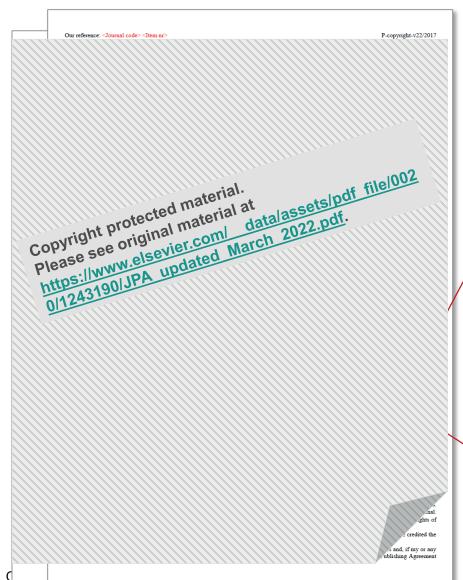
available at https://www.elsevier.com/about/policies/copyright

Assignment of copyright

I hereby assign to the Copyright Owner [i.e. the publisher!] the copyright in the manuscript identified above (...). This assignment of rights means that I have **granted to the**Copyright Owner the exclusive right to publish and reproduce the Article, or any part of the Article, in print, electronic and all other media (whether now known or later developed), in any form, in all languages, throughout the world, for the full term of copyright, and the right to license others to do the same, effective when the Article is accepted for publication.



Journal Publishing Agreement - Elsevier



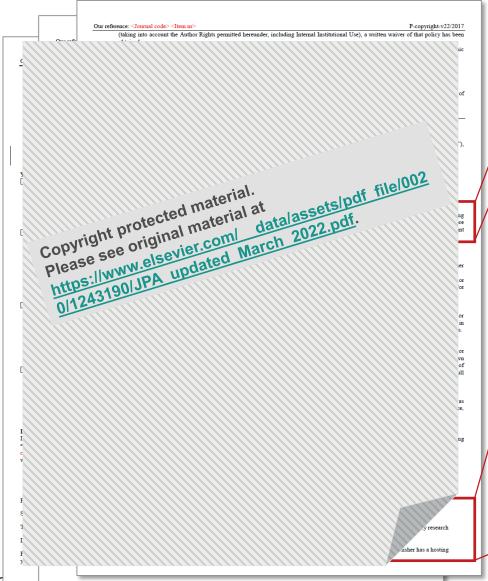
<u>Author Rights for Scholarly Purposes</u> (see 'Definitions' clause below)

- (...) include the right to use these different versions of the Article for Scholarly Sharing purposes, which include sharing:
- the Preprint on any website or repository at any time;
- the Accepted Manuscript on certain websites and usually after an embargo period;
- the Published Journal Article only privately on certain websites, unless otherwise agreed by the Copyright Owner.

In the case of the Accepted Manuscript and the Published Journal Article the Author Rights exclude Commercial Use (...), other than use by the author in a subsequent compilation of the author's works or to extend the Article to book length form or re-use by the author of portions or excerpts in other works (...).



Elsevier – Definitions



Accepted Manuscript

(...) should bear a **Creative Commons CC BY-NC-ND** license.

[see https://www.lib4ri.ch/research-funders-oa-policies#Remove-the-embargo-for-Elsevier-accepted-manuscripts-in-DORA]

Accepted Manuscript:

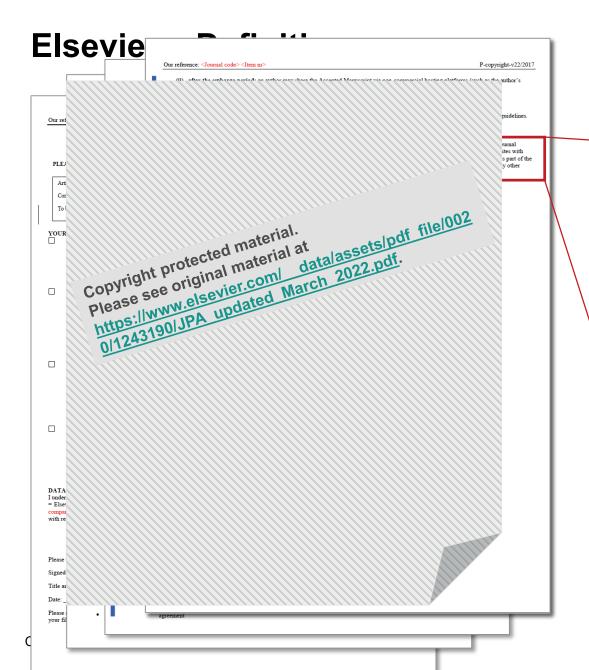
- (i) immediately on acceptance: (...):
- via the author's non-commercial personal homepage or blog (...)
- (ii) after the embargo period: an author may share the Accepted Manuscript via non-commercial hosting platforms (such as the author's institutional repository) and via commercial sites with which the publisher has a hosting agreement.

To check the embargo period for the journal, go to http://www.elsevier.com/embargoperiodlist

The publisher has agreements with certain funding agencies (...)







Published Journal Article: the author may share a link to the formal publication through the relevant DOI or may share the Published Journal Article privately with students or colleagues for their personal use, or privately as part of an invitation-only work group on commercial sites with which the publisher has a hosting agreement. Additionally theses and dissertations which contain embedded Published Journal Articles as part of the formal submission may be hosted publicly by the awarding institution with a link to the formal publication through the relevant DOI. Any other sharing of Published Journal Articles is by agreement with the publisher only.



Read it, change it and then sign it

- Modify critical topics in the copyright transfer agreement such as "exclusive" transfer of "all" rights.
 It doesn't have to be all or nothing.
- o Alternatively, add an addendum (e.g. SPARC https://sparcopen.org/our-work/author-rights/) that retains these rights or
- Use the Rights Retention Strategy (from Coalition S)
 - funder: grant conditions require a CC licence
 - corresponding author informs the publisher (via cover letter and/or acknowledgements):
 "This research was funded in whole or in part by [Funder, grant number]. For the purpose of Open Access, the author has applied a CC BY public copyright licence to any Author Accepted Manuscript (AAM) version arising from this submission."
 - corresponding author sends AAM with the information on the RRS to a repository (e.g. DORA: https://www.dora.lib4ri.ch/)
 - More information: https://www.coalition-s.org/rights-retention-strategy/



21

Copyright & CC licences

May 2024

© (1)





Re-use in a Scientific Context





How to reuse a copyright protected work?

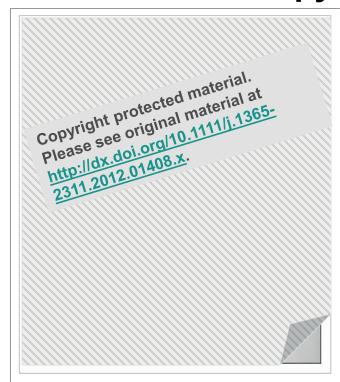


Figure 1

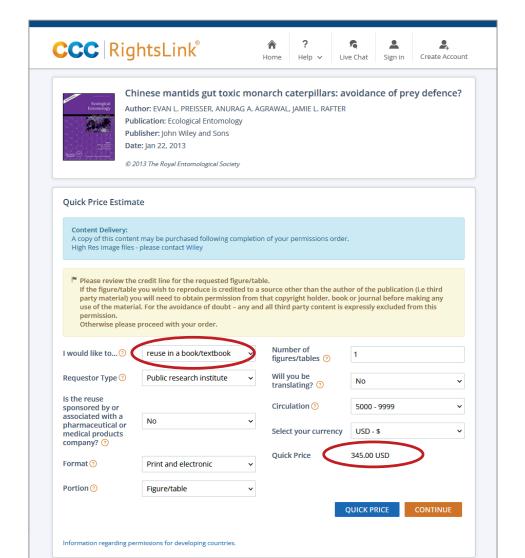
Open in figure viewer PowerPoint

Adult Chinese mantid (Tenodera sinensis) gutting a final-instar monarch (Danaus plexippus) caterpillar. For scale, mantid forelegs are ~3 cm in length. Photo credit: Alex Allaux.

Wiley Online Library Access by Access provided by Lib4RI Enter ' Publish Open Access with the RE **Ecological** ☐ Full Access Chinese mantids gut toxic monarch caterpillars: avoidance of prey defence? JAMIE L. RAFTER, ANURAG A. AGRAWAL, EVAN L. PREISSER First published: 22 January 2013 | https://doi.org/10.1111/j.1365-2311.2012.01408.x | Cited by: 14 Lib4RI Services < SHARE **SECTIONS** ▼ TOOLS Request permission Abstract Export citation 1. Monarch caterpillars, Danaus plexippus (Linna in the genus Asclepias and sequester cardenolides as a ever, some ☆ Add to favorites predators are able to consume this otherwise u 2. Chinese mantids, Tenodera sinensis (Saussure ionarch Track citation caterpillars by 'gutting' them (i.e. removing the g ans). They then feed on the body of this herbivore without any apparent ill effects. 3. How adult T. sinensis handle and consume toxic (D. plexippus) and non-toxic [Ostrinia nubilalis (Hübner) and Galleria mellonella (Linnaeus)] caterpillars was explored. The



You have to ask for permission

















Chinese mantids gut toxic monarch caterpillars: avoidance of prey defence?

Author: EVAN L. PREISSER, ANURAG A. AGRAWAL, JAMIE L. RAFTER

Publication: Ecological Entomology

Publisher: John Wiley and Sons

Date: Jan 22, 2013

© 2013 The Royal Entomological Society

Content Delivery: A copy of this content may be purchased following completion of your permissions order. High Res Image files - please contact Wiley					
Please review the credit line for the requested figure/table. If the figure/table you wish to reproduce is credited to a source other than the author of the publication (i.e third party material) you will need to obtain permission from that copyright holder, book or journal before making any use of the material. For the avoidance of doubt – any and all third party content is expressly excluded from this permission. Otherwise please proceed with your order.					
l [™] John Wiley and So	ons grants a license for all orde	ers, includ	ling \$0 orders. Please sele	ct the Continue butt	on and place
	ons grants a license for all orde	ers, includ	ling \$0 orders. Please sele	ct the Continue butt	on and place
l [™] John Wiley and So	ons grants a license for all orde		ling \$0 orders. Please sele Number of figures/tables ①	ct the Continue butt	on and place
John Wiley and So	ons grants a license for all ordereuse.		Number of		on and place
John Wiley and So an order for this i	ons grants a license for all ordereuse. reuse in a dissertation/th	esis 🗸	Number of figures/tables ① Will you be	1	on and place
I would like to Requestor Type O	reuse in a dissertation/th	esis v	Number of figures/tables ⑦ Will you be translating? ⑦	1 No	on and place

© 2021 Copyright - All Rights Reserved | Copyright Clearance Center, Inc. | Privacy statement | Terms and Conditions Comments? We would like to hear from you. E-mail us at customercare@copyright.com

Home » Intellectual Property » Permissions » Permissions Guidelines

Permissions Guidelines

Download the 2020 version of the Permission Guidelines (2020 version)

In order to participate and become a signatory to the Guidelines, the publisher must be a member of STM. Please visit the Members section for information on how to join the Association.

If you are interested in participating in the permissions guidelines, you will need to contact info@stm-assoc.org to request an additional form for completion. Please note that participation of the guidelines is based on a principle of reciprocity and you must be a publisher of primary research. Members are also encouraged to familiarise themselves with the guidelines prior to application. All signatories are encouraged to participate in the quarterly STM Permissions guidelines roundtable.

Authors and researchers wishing to obtain permissions are referred to their respective publishers.

Signatories to STM Permissions Guidelines as of 28 April 2021

	ne of Publisher - STM nber	Notification not required ("automatic" process)	Notification required	Permissions contact (or general web site)/ Other comments for specific journals or other concerns	
--	-------------------------------	--	--------------------------	---	--

AIP Pul

Americ Critica (AACN

3. Quantity limit for gratis permission

Subject to formal approval by the individual publisher when required (please refer to the specific requirements of each publisher under the list of Signatories to the STM Permissions Guidelines), gratis permission is granted to use the following quantities of Licensed Content in a journal article or book being prepared for publication by another Signatory:

- Use a maximum of 3 (three) figures/tables/images from an individual journal article or book chapter, subject to the following limits:
 - A maximum total of 5 (five) figures/tables/images from a single book or journal issue/edition.
 - A maximum total of 6 (six) figures/tables/images from an annual journal volume.
 - A maximum total of 3 (three) figures/tables/images from works published by a single Signatory for use in any given journal article or book chapter.
 - A maximum total of 30 (thirty) figures/tables/images from a single Signatory

https://www.stm-assoc.org/intellectual-property/permissions/permissions-guidelines/





? Heln ∨ Live Chat

n in Cr

Create Account



Chinese mantids gut toxic monarch caterpillars: avoidance of prey defence?

Author: EVAN L. PREISSER, ANURAG A. AGRAWAL, JAMIE L. RAFTER

Publication: Ecological Entomology

Publisher: John Wiley and Sons

Date: Jan 22, 2013

Information regarding permissions for developing countries

© 2013 The Royal Entomological Society

Quick Price Estimat	:e					
Content Delivery: A copy of this content may be purchased following completion of your permissions order. High Res Image files - please contact Wiley						
If the figure/table y party material) you use of the materia permission.	Please review the credit line for the requested figure/table. If the figure/table you wish to reproduce is credited to a source other than the author of the publication (i.e third party material) you will need to obtain permission from that copyright holder, book or journal before making any use of the material. For the avoidance of doubt – any and all third party content is expressly excluded from this permission. Otherwise please proceed with your order.					
reuse up to 3 figur	John Wiley and Sons is a signatory to the STM Permissions Guidelines, which enable fellow signatory publishers to reuse up to 3 figures/tables free of charge. If you require a grant of license please complete your order. You will not be charged for this permission.					
Please use "Publisher (STM Signatory)" if you are an employee of an STM Signatory Publisher and/or an author publishing with an STM Signatory Publisher.						
I would like to 🤊	reuse in a book/textbook v	Number of figures/tables ?	1			
Requestor Type ①	Publisher (STM Signatory)	Will you be translating? ①	No v			
STM publisher name	Elsevier 🗸	Circulation ①	5000 - 9999 💙			
Is the reuse sponsored by or associated with a		Select your currency	USD - \$			
pharmaceutical or medical products company?	No v	Quick Price	0.00 USD			
Format 🕖	Print and electronic v					
Portion 10	Figure/table v					
		Q	UICK PRICE CONTINUE			

Winter cascading of cold water in Lake Geneva

Ilker Fer1 and Ulrich Lemmin

Laboratoire de Recherches Hydrauliques, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

Please see original material at http://dx.doi.org/10.1029/2001JC000828. Copyright protected material. Please see original material at

profilings con-23 December 1998,

dunng experiment I and (b) 1200 and 1500 LT, 20 January 2000, during experiment II. The contours are in degrees Celsius. The profiling stations are indicated by arrows. Open circles in Figure 2a show the temperature miniloggers laid at the bottom, as well as the one 2 m off the bottom at 4



Annual Review of Fluid Mechanics

Convection in Lakes

Damien Bouffard¹ and Alfred Wüest^{1,2}

Copyright protected material.

Copyright protected material at

Please see original material at

https://doi.org/10.1146/annurev-fluid-010518-040506

e. If scaled

- of 11 times that of the main tributary (Rhône River) during winter. Figure Novigate cited of adapted with permission from Fer et al. (2002)
- Explore related arti
- Share via email or social media

Additionally, the peculiar properties of the density function at low salinities/ temperatures leave distinctive traces. In this review, we present these various processes and connect observations with theories and model results.

Copyright 2002 by the American Geophysical Union. 0148-0227/02/2001JC000828

189

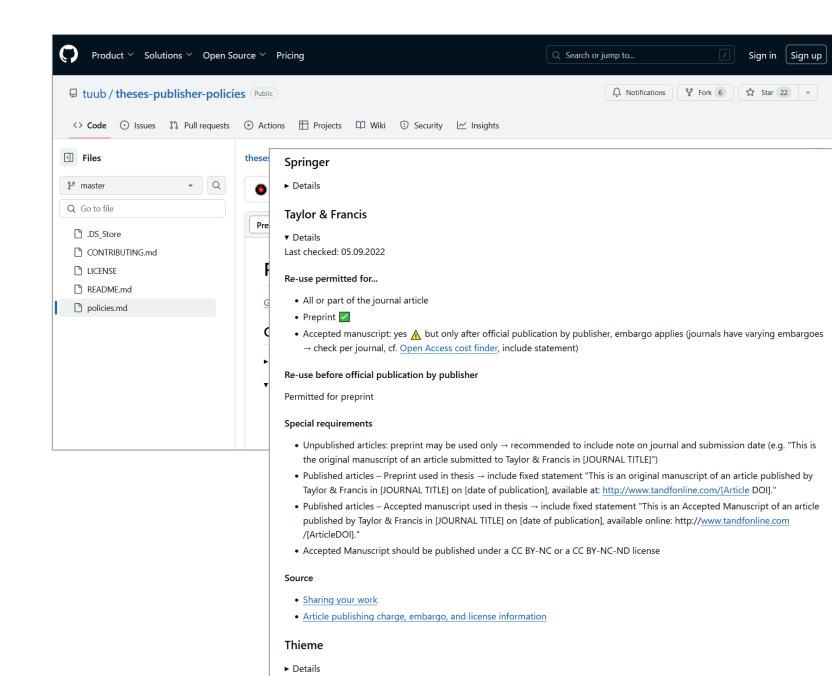


Re-use in theses

- Conditions are mostly defined in the Copyright Transfer Agreement
- There are compilations of standard policies for most publishers

https://github.com/tuub/theses-publisher-policies/blob/master/policies.md

https://unlimited.ethz.ch/display/RC/ Cumulative+doctoral+theses







Creative Commons Licences





You can allow the usage of your works



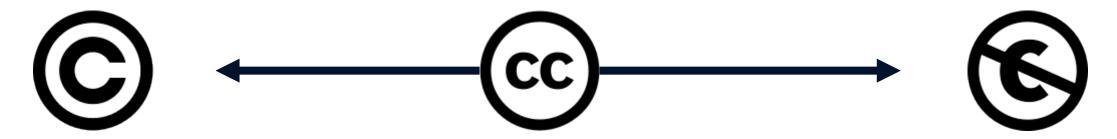
Wanna Work Together? by Creative Commons, https://creativecommons.org/about/videos/wanna-work-together/, https://creativecommons.org/about/videos/wanna-work-together/, CC BY.

(i)

May 2024



Spectrum of rights



Copyright

- All Rights Reserved
- Re-use requires the permission of the copyright holder

Creative Commons Licences

- Some Rights Reserved
- Re-use is permitted without permission under the specifications shared in the licence

Public Domain

- No Rights Reserved
- May be used without permission

Copyright restrictions can be OPENED with an overlaying Creative Commons Licence



cc creative commons

- nonprofit organization
- standardized way to give the permission to share and use copyrighted works
- o free and easy to use

As the creator

you choose and indicate the conditions

As the user

o the intended use is clear – no need to get permission, just provide the attribution





Modular design of CC licences

4 main elements of the Creative Commons Licences:

BY	Attribution	give attribution to the author and link to the licence	mandatory
SA SA	ShareAlike	derivative works need to be made available under same licence	optional
S NC	NonCommercial	re-use is only permitted for non-commercial purposes	optional
■ ND	NoDerivatives	the work must not be modified	optional

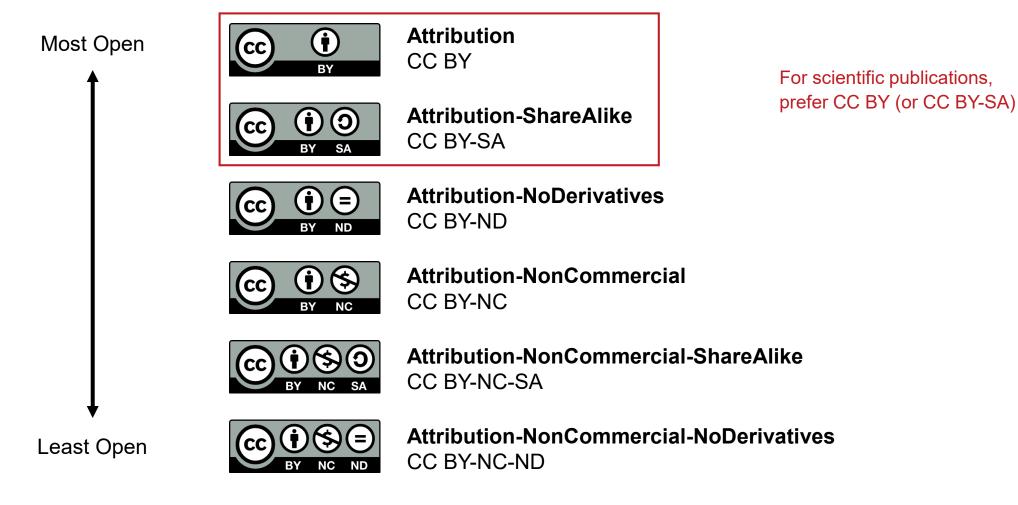
Copyright & CC licences

May 2024

© (1)



The 6 licences



The 3 layers of a Creative Commons licence



Example:



This work is licensed under a Creative Commons Attribution 4.0 International Licence.





<img</pre> alt="Creative Commons License" style="border-width:0" src="https://i.creativecommons.org/l/by/4.0/88x31.png" />
This work is licensed under a Creative Commons Attribution 4.0 International License.

(e) (i)





How to work with CC licences

How to get a licence?

It is easy:

creativecommons.org/choose

- Do you know which license you need?
 - Yes, I know the license I need.
 - O No. I need help selecting a license.

- Do you want attribution for your work?
 - Yes. Anyone using my work must include proper attribution.
 - No. Anyone can use my work, even without giving me attribution.



WHO WE ARE WHAT WE DO LICENSES AND TOOLS BLOG SUPPORT US

Home > Chooser

LICENSE CHOOSER

Follow the steps to select the appropriate license for your work. This site does not store any information.



- 2 Attribution
- 3 Commercial Use
- 4 Derivative Works
- 5 Sharing Requirements
- 6 Confirm that CC licensing is appropriate
- 7 Attribution Details

RECOMMENDED LICENSE



Attribution 4.0 International

This license requires that reusers give credit to the creator. It allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, even for commercial purposes.

• BY: Credit must be given to you, the creator.

See the License Deed [4]

May 2024

Explore CC

How to get a licence?

It is easy:

creativecommons.org/choose



- ✓ I own or have authority to license the work.
- I have read and understand the terms of the license.
- ✓ I understand that CC licensing is not revocable.

BACK



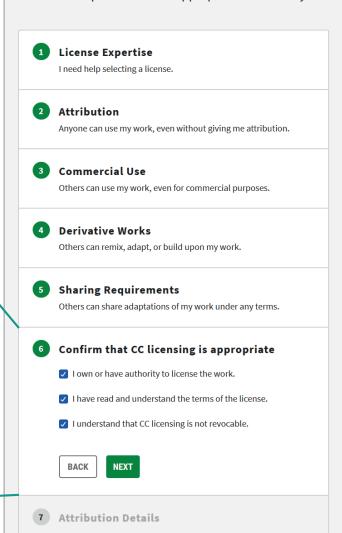


WHO WE ARE WHAT WE DO LICENSES AND TOOLS BLOG SUPPORT US

Home > Chooser

LICENSE CHOOSER

Follow the steps to select the appropriate license for your work. This site does not store any information.



RECOMMENDED LICENSE



(cc) (i) CC BY 4.0

Attribution 4.0 International

This license requires that reusers give credit to the creator. It allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, even for commercial purposes.

• BY: Credit must be given to you, the creator.

See the License Deed 🖸

Explore CC



How to get a licence?

It is easy:

creativecommons.org/choose

All you need:

- o icon
- o link to the licence deed



Home > Chooser

LICENSE CHOOSER

Follow the steps to select the appropriate license for your work. This site does not store any information.



I own or have authority to license the work.

I have read and understand the terms of the license.

I understand that CC licensing is not revocable.

7 Attribution Details

RECOMMENDED LICENSE



Attribution 4.0 International

This license requires that reusers give credit to the creator. It allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, even for commercial purposes.

• BY: Credit must be given to you, the creator.

See the License Deed 🖸



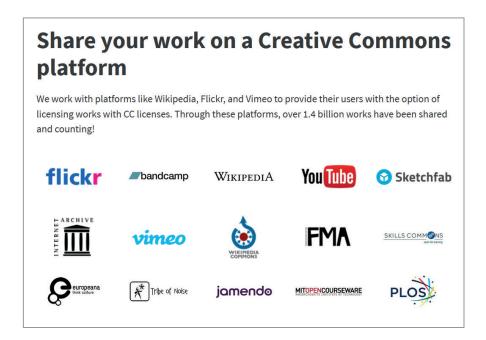
How to license and mark your content

 Copy and paste icon and phrase e.g. to a cover page or a footer:



This work is licensed under a <u>Creative Commons</u>
Attribution 4.0 International Licence.

- Other icons: https://creativecommons.org/about/downloads/
- Further information: Licensing & Marking Your Content with Creative Commons:
 https://wiki.creativecommons.org/images/6/61/Creativecommons-licensing-and-marking-your-content eng.pdf



Publish Open Access

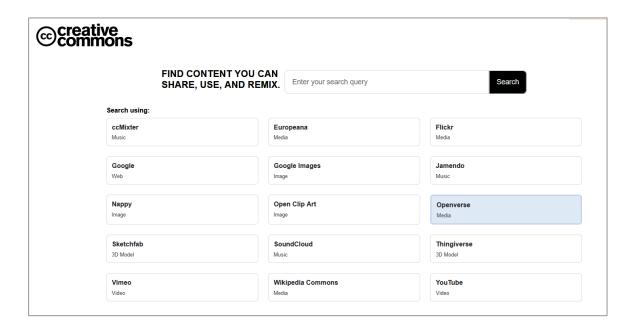
Copyright & CC licences May 2024 © 🛈



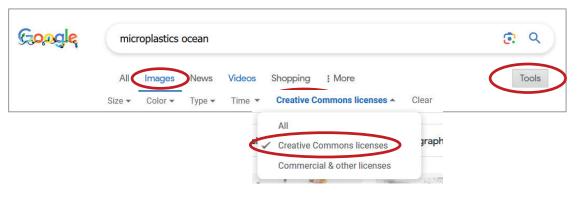
Where to find CC-licensed images?

Creative Commons Search

https://search.creativecommons.org/



Google Image Search



Copyright & CC licences

May 2024

© (i)



Exercise

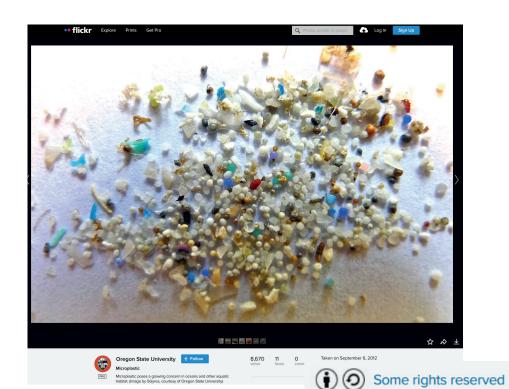
Assume, you are creating a presentation with the topic **«Microplastics in the Ocean»**. The presentation slides will be on the web.

- 1. Can you find a photograph on the web, that you can use for this presentation?
- 2. What exactly is the licence for the photograph, you have chosen.
- 3. How would you cite this photograph in your presentation?

(i) (ii)



How to reuse CC-licensed works? – An Example



Just give attribution:

- Creator
- o (Title)
- Link to the source
- o licence (with link!)

Further information: Best practices for attribution



Oregon State University: «Microplastics» https://www.flickr.com/photos/33247428@N08/21282786668, CC BY-SA 2.0

COMMUNICATION

www.advancedscience.com

Biological Photocatalysts

Green-Light-Activated Photoreaction via Genetic Hybridization of Far-Red Fluorescent Protein and Silk

Jung Woo Leem, Jongwoo Park, Seong-Wan Kim, Seong-Ryul Kim, Seung Ho Choi, Kwang-Ho Choi,* and Young L. Kim*

Fluorescent proteins often result in phototoxicity and cytotoxicity, in particular because some red fluorescent proteins produce and release

ADVANCED SCIENCE NEWS

www.advancedsciencenews.com

Visible light-driven plasme talvsis, which relies on th of semiconductor phot

mKate2 (transgenic)

reactive ox as a detrin for ablatin produced into mater reported ti silk provid control of and regen singlet oxy photocata immediate is further

nanomate Dr. J. W. Leer Department

concerns :

Weldon Scho Purdue Unive West Lafayett E-mail: young Dr. J. Park, D National Inst Rural Develo Wanju, Jeolla E-mail: ckh@ Prof. Y. L. Kin Regenstrief C Purdue Unive West Lafayett Prof. Y. L. Kin

Purdue University West Lafayette, IN 47907, USA

The ORCID identification number(s) for the author(s) of this article can be found under https://doi.org/10.1002/advs.201700863.

© 2018 The Authors. Published by WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim. This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited

DOI: 10.1002/advs.201700863

Adv. Sci. 2018, 5, 1700863

1700863 (1 of 8)

fluorescent image of mKate2 (transgenic) silkworms.

acteristics of RFP suggest that semiconductor nanocrystals or conjugated nanoparticles for plasmonic photocatalysis can be replaced by phototoxic RFP.

Figure 1. Genetically encoded hybridization of far-red fluorescent protein (mKate2 and PDB ID: 3BXB) and silk for plasmonic photocatalysis-like

photosensitization. a) Schematic illustration of reactive oxygen species (ROS)-generating mKate2 (transgenic) silk under green light activation.

Superoxide (O2*) and singlet oxygen (1O2) are generated by mechanisms of electron (e1) transfer and energy (E) transfer, respectively. Photographs

of white (wild-type) and mKate2 (transgenic) silk cocoons and fluorescent image of mKate2 silk cocoons. Green light belongs to the peak wavelength

range of the solar spectrum. b) Construction of transfer vector p3xP3-EGFP-pFibH-mKate2 for mKate2 silkworm transgenesis. c) Photograph and

Some fluorescent proteins participate in Type I and Type II photosensitization reactions.[7] Predominant ROS generated by fluorescent proteins depends on the type of photosensitization reactions and the concentration of local molecular oxygen (i.e., electron acceptor). For example, (enhanced) green fluorescent protein, (E)GFP typically produces singlet oxygen (102) via Type II

© 2018 The Authors. Published by WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim

A ANNUAL REVIEWS

Annual Review of Biomedical Engineering Transgenic and Diet-Enhanced

pFibH SV40pA p3×P3-eGFPpFibH-mKate2

Figure 1

kmn. Rev. Biomed. Eng. 2020.22:79-102. Downloaded from www.amualreviews.org ed by Eidgenossische Ansalt fur Wasserversorgung (EAWAG) on 06/22/20. For perso

Annu. Rev. 20 First publis March 11, The Annua online at bi https://doi. 032747

(871 bp); ITR, inverted repeat sequences of piggyBae arms; mKate2, monomeric far-red fluorescent protein (720 bp) derived from Entacmaea quadricolor; NTR-1, N-terminal region 1 (142 bp); NTR-2, N-terminal region 2 (417 bp); pFibH, fibroin heavy-chain promoter domain (1,124 bn): PolyA poly(A) signal region (301 bn): 3×P3, 3×P3 promoter (273 bn): SV40, SV40 polyadenylation signal sequence (268 bp) Figure adapted from Reference 161 under a Creative Commons license (CC-BY-4.0). Copyright © 2020 by Annual Reviews

All rights reserved

ANNUAL CONNECT

www.annualreviews.org

- Download figures
- Navigate cited references
- Keyword search
- · Explore related articles
- · Share via email or social media

physical and biological properties that typical synthetic materials do not exhibit. These attributes have prompted a wide variety of silk research, including genetic engineering, biotechnological synthesis, and bioinspired fiber spinning, to produce silk proteins on a large scale and to further enhance their properties. In this review, we describe the basic properties of spider silk and silkworm silk and the important production methods for silk proteins. We discuss recent advances in reinforced silk using silkworm transgenesis and functional additive diets with a focus on biomedical applications. We also explain that reinforced silk has an analogy with metamaterials such that user-designed atypical responses can be engineered beyond what naturally occurring materials offer. These insights into reinforced silk can guide better engineering of superior synthetic biomaterials and lead to discoveries of unexplored biological and medical applications of silk.

Representative genetic fusion of fluorescent proteins (e.g., mKate2) and silk (161). (a) Construction of transfer vector p3×P3-eGFPpFibH-mKate2 for mKate2 silkworm transgenesis using a gene-splicing piggyBac transposase method. For hybridization of mKate2 and

silk, the mKate2 gene is fused with N-terminal and C-terminal domains of pFibH. The nucleotide sequences of the pFibH NTR and

(transgenic) silkworms. Abbreviations: CTR, C-terminal region (179 bp); eGFP, enhanced green fluorescent protein; intron, first intron

CTR are derived from GenBank accession number AF226688. (b) (left) Photograph and (right) fluorescent image of mKate2

79



Copyright & CC licences



Reusability

Scientific Information: Exponential Increase

Copyright protected material.

Copyright protected material at

Please see original material at

http://dx.doi.org/10.1023/A:1010520913124.

(From: Mabe M & Amin M, 2001: Growth dynamics of scholarly and scientific journals. Scientometrics 51, 147-162, DOI: 10.1023/A:1010520913124).

(From: Larsen PO & M Ins, 2010: The rate of growth in scientific publication and the decline in coverage provided by Science Citation Index. Scientometrics 84, 575-603, DOI: 10.1007/s11192-010-0202-z CC-BY-NC).

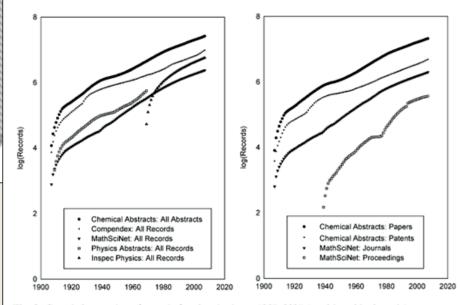
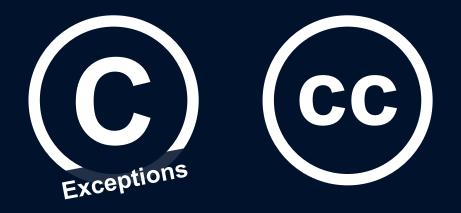


Fig. 2 Cumulative number of records for nine databases 1907-2007 (semi logarithmic scale)



15





Let's sum up

(i)



Let's sum up

	CC licence	Copyright
Purpose	propagation	control
Advantage	reusability, visibility, impact	monetarisation of the publication
How to license it?	just mark it via uploading to a system / Open Access publishing	you have it (unless you give your rights away, e.g. via "Copyright Transfer Agreements",…)
Mark it?	with CC button	with © (although not necessary)
How to use material?	just give attribution	ask copyright holder for permission

Copyright & CC licences

May 2024

© (*)



Thank you for your attention!

Feedback!

Questions? – Contact!

publicationservices@lib4ri.ch = openaccess@lib4ri.ch

Jochen Bihn+41 58 765 5228



André Hoffmann+41 58 765 5590



Lothar Nunnenmacher+41 58 765 5221





47



Sources and further reading

Copyright

- Lib4RI: Webpage and Info Sheet: Copyright & CC Licences
 - https://www.lib4ri.ch/copyright-cc-licences
- CCdigitallaw: Basics of Copyright. https://www.ccdigitallaw.ch/introduction/
- UNESCO, 2015: Intellectual Property Rights. https://unesdoc.unesco.org/ark:/48223/pf0000232208
- WIPO, 2016: Understanding Copyright and Related Rights. Geneva: WIPO. http://www.wipo.int/publications/en/details.jsp?id=4081
- Switzerland: The Federal Council: Federal Act on Copyright and Related Rights.
 https://www.fedlex.admin.ch/eli/cc/1993/1798_1798_1798/en
- Copyright Law of the United States. https://www.copyright.gov/title17/
- Association of Research Libraries: Know Your Copyrights.

https://www.arl.org/know-your-copyrights/

Author rights

- Bailey Jr, CW, 2008: Author's Rights, Tout de Suite. Digital Scholarship.
 - http://digital-scholarship.org/ts/authorrights.pdf
- Science Commons: Scholar's Copyright Addendum Engine. http://scholars.sciencecommons.org/
- SPARK, 2006: Author Rights & the SPARC Author Addendum. https://sparcopen.org/our-work/author-rights/

Creative Commons

- Creative Commons, <u>https://creativecommons.org/</u>
- Licensing & Marking Your Content with Creative Commons.
 https://wiki.creativecommons.org/images/6/61/Creativecommons-licensing-and-marking-your-content eng.pdf





Lib4RI – Excellent Services for Excellent Research.

www.lib4ri.ch info@lib4ri.ch T: + 41 58 765 57 00