DESCRIPTION

Solar Energy, the official journal of the International Solar Energy Society®, is devoted exclusively to the science and technology of solar energy applications.

The Society was founded in 1954 and is now incorporated as a non-profit educational and scientific institution. With participation encompassing 100 countries, ISES® serves as a centre for information on research and development in solar energy utilisation. Through its publications and its sponsorship of technical conferences, the Society provides a world forum for the active consideration of solar energy.

Solar Energy welcomes manuscripts presenting information not previously published in journals on any aspect of solar energy research, development, application, measurement or policy. The term "solar energy" in this context includes the indirect uses such as wind energy and biomass. Because of the international character of Solar Energy, articles that deal solely with the solar radiation or wind data base of a specific country are not normally considered suitable for Solar Energy. Submitted manuscripts may take the form of reports of original studies or reviews of significant prior work in a given area. All manuscripts are subject to reviews to assure accuracy, clarity, and long-term value.

Manuscripts of general interest not being suitable for Solar Energy should be submitted to Refocus, which publishes magazine-style feature articles concerning all aspects of renewable energy. Please e-mail David Hopwood, Editor for further details (d.hopwood@elsevier.co.uk) and visit http://www.re-focus.net.

AUDIENCE

Engineers, scientists, architects and economists active in the fields of systems, components, materials and services for the diverse applications of solar energy.

IMPACT FACTOR

2019: 4.608 © Clarivate Analytics Journal Citation Reports 2020
ABSTRACTING AND INDEXING

Applied Mechanics Reviews
EIC/Intelligence
Current Contents
Elsevier BIOBASE
BIOSIS Citation Index
Engineering Index
Environmental Periodicals Bibliography
Applied Science and Technology Index
Physical Sciences Digest
Scopus
INSPEC
Web of Science
Science Citation Index Expanded
Engineering Index Monthly
CSA Sustainability Science Abstracts (Cambridge Scientific Abstracts)
Environmental Engineering Abstracts
Environmental Sciences & Pollution Management
METADEX
TEMA - Technik und Management
GeoRef
AGRICOLA
Academic Search (EBSCO)
Computers & Applied Sciences Complete
Current Abstracts (EBSCO)
Energy & Power Source
Environment Complete
Environment Index
TOC Premier
Compendex
Engineering Information Database EnCompass LIT (Elsevier)
FLUIDEX
Engineering Village - GEOBASE
Wilson Applied Science and Technology Abstracts
OCLC Contents Alert
Personal Alert
ProQuest

EDITORIAL BOARD

Editor-in-Chief
Yogi Goswami, University of South Florida, Tampa, Florida, United States

Subject Editors

Concentrating Solar Power and High Temperature Processes
Ranga Pitchumani, Virginia Tech Research Center Department of Mechanical Engineering, Arlington, Virginia, United States

Photovoltaics
Nicola Romeo, University of Parma, Parma, Italy

Resources & Meteorology
Dazhi Yang, Singapore Institute of Manufacturing Technology, Singapore, Singapore

Solar Heating and Cooling, Buildings & Other Applications
Yanjun DAI, Shanghai Jiao Tong University, Shanghai, China
**Associate Editors**

**Chemical Processes, Photocatalysis and Photocatalytic Processes**

Rodrigo Albuquerque  
Chemical Processes, Photocatalysis

Raju Gupta, Indian Institute of Technology Kanpur, Kanpur, India  
Chemical Processes, Photocatalysis, Perovskite Solar Cells, Energy and Environment, Solar Energy

Gloria Tabacchi, University of Insubria, Varese, Italy

**Concentrating Solar Power and High Temperature Processes**

Antoine Bittar  
CSP, Optical Properties

Luisa F. Cabeza, University of Lleida, Lleida, Spain  
Thermal Energy Storage

Michael Epstein, Weizmann Institute of Science, Rehovot, Israel  
CSP, High Temperature Solar Chemistry, Energy Storage

José González-Agüilar, Madrid Institute of Advanced Studies, Madrid, Spain  
CSP, Central Receiver, Heat Transfer Fluids, High-temperature Solar Reactor

Clifford Ho, Sandia National Laboratories, Albuquerque, New Mexico, United States  
CSP, Receivers

Wojciech Lipiński, Australian National University, Canberra, Australia  
Solar Chemistry

Peter G. Loutzenhiser, Georgia Institute of Technology, Atlanta, Georgia, United States

Jayanta Nayak, Indian Institute of Technology Bombay, Mumbai, India  
CSP, Parabolic Trough

Halime Paksoy, Cukurova University, Adana, Turkey  
Energy Storage

Robert Pitz-Paal, German Aerospace Center DLR Institute of Solar Research, Köln, Germany  
CSP Systems, Heat Transfer Fluid, Modelling, Optical Measurement

Joseph Stekli, Electric Power Research Institute, Palo Alto, California, United States  
renewables, energy economics

Lorin Vant-Hull  
CSP, Central Receiver Tower

**Other Solar Energy Related Areas**

Andreas K. Athienitis, Concordia University, Montréal, Quebec, Canada

Gion Calzaferri, University of Bern, Bern, Switzerland  
Chemical Processes

S.A. Sherif, University of Florida Department of Mechanical and Aerospace Engineering, Gainesville, Florida, United States  
Hydrogen, Solar Chimney

**Photovoltaics**

Maurizio Acciarri, University of Milan–Bicocca, Milano, Italy

Alessio Bosio, University of Parma, Parma, Italy  
Photovoltaics, PV and Cell Physics, Renewable/Solar

Thomas M. Brown, University of Rome Tor Vergata  
Photovoltaics

Paola Delli Veneri, ENEA Centro Ricerche Portici, Portici, Italy  
Photovoltaics

L. Giribabu, Indian Institute of Chemical Technology, Hyderabad, India

Carlos Graeff, Sao Paulo State University Julio de Mesquita Filho Bauru Campus Faculty of Sciences, Bauru, Brazil  
His field of interest is Materials Science, more specifically electronic magnetic resonance, biomaterials and electronic devices (solar cells and thin film transistors).

Arnulf Jäger-Waldau, European Commission Joint Research Centre Ispra Sector, Ispra, Italy  
Photovoltaics, PV Systems, Energy and the Environment, Renewable Energy Policy, Economics of PV Systems

Quyet Van Le, Duy Tan University, Viet Nam  
Photovoltaics, Photocatalysis, Perovskite Solar Cells, Organic Solar Cells, DSSC

Arturo Morales-Acevedo, Center for Research and Advanced Studies of the National Polytechnic Institute, Ciudad de Mexico, Mexico  
PV and Cell Physics

Brian Norton, Technological University Dublin, Dublin, Ireland  
Building Integrated PV, Luminescent Devices, daylight, Thermal Management of PV, Collector Technology, PVT Collectors

Frank Alain Nüesch
Dye Sensitized, Organic Solar Cells, Hybrid Solar Cells

**Mukund Patel**, United States Merchant Marine Academy, Kings Point, New York, United States
Wind/Hybrid

**Jeyakumar Ramanujam**, National Physical Laboratory CSIR Advanced Materials and Device Metrology Division, New Delhi, India
Green energy, Solar cells, Electronic materials, Characterization, Materials Science

**Takhir Razykov**, Academy of Sciences of the Republic of Uzbekistan Physicotechnical Institute
PV and Cell Physics

**Wilfried van Sark**, Utrecht University, Utrecht, Netherlands
Photovoltaics

**Elias K. Stefanakos**, University of South Florida, Tampa, Florida, United States
Photovoltaics

**Igor Tyukhov**, All-Russia Research and Development Institute of Electrification of Agriculture, Moskva, Russian Federation
PV and Cell Physics, PVT Systems, Concentrators, PV Systems, Thin Film Cells

**Gaetano Zizzo**, University of Palermo, Palermo, Italy
Photovoltaics

**Resources & Meteorology**

**Hans-Georg Beyer**, University of the Faroe Islands, Torshavn, Faroe Islands
Energy meteorology

**Philippe Blanc**, MINES ParisTech - Sophia Antipolis Campus, Sophia Antipolis Cedex, France
Solar Radiation, Solar Resource Assessment, Solar Forecasting, Aerosols, Pyranometric Sensors, All-sky Cameras

**Christian Gueymard**, Solar Consulting Services, Colebrook, New Hampshire, United States
Solar Radiation, Solar Resource Assessment, Aerosols

**Tao Hong**, University of North Carolina at Charlotte, Charlotte, North Carolina, United States
General-purpose forecasting, Energy analytics, Load forecasting

**Merlinde Kay**, University of New South Wales, Sydney, New South Wales, Australia
Meteorology, Numerical weather prediction

**Anders Lindfors**, Finnish Meteorological Institute, HELSINKI, Finland
Solar Heating and Cooling, Buildings & Other Applications

**Aliakbar (Ali) Akbarzadeh**, RMIT University College of Science Engineering and Health, Melbourne, Australia
Solar Ponds

**Bibek Bandypadhyay**, Indian Institute of Engineering Science and Technology, Howrah, India
Solar Thermal / Solar Heating and Cooling

**Abhijit Date**, RMIT University, Melbourne, Victoria, Australia
Solar Ponds

**Ursula Eicker**, University of Applied Sciences Stuttgart, Stuttgart, Germany
Solar Heating and Cooling, Building Energy Efficiency, Passive Heating and Cooling

**Adrian-Gabriel Ghiaus**, Technical University of Civil Engineering of Bucharest, Bucharest, Romania
Thermodynamics, Heat & Mass Transfer, Drying, Modeling & Simulation

**Mario Medina**, University of Kansas, Lawrence, Kansas, United States

**Halime Paksoy**, Cukurova University, Adana, Turkey
Energy Storage

**Anna Laura Pisello**, University of Perugia, Perugia, Italy
Building Thermal Applications/Daylighting

**Mattheos Santamouris**, National and Kapodistrian University of Athens, Athens, Greece
Passive Cooling, Urban Heat Island, Microclimate, Local Climate Change, Mitigation Technologies, Cool and Green Roofs, Cool Pavements

**Jean-Louis Scartezzini**, Federal Polytechnic School of Lausanne, Lausanne, Switzerland
Daylighting and Solar Buildings

**Ruzhu Wang**, Shanghai Jiao Tong University, Shanghai, China
Refrigeration and HVAC, Sorption cooling, Heat pumps, Solar energy, Thermal energy storage, Energy-water-air nexus

**Bulent Yesilata**, Ankara Yildirim Beyazit University, Energy Systems Engineering Department, Çubuk, Turkey

Solar Heating and Cooling, Thermodynamics, Heat Transfer, Fluid Mechanics, CSP
INTRODUCTION
Solar Energy, the official journal of the International Solar Energy Society (ISES), is devoted exclusively to the science and technology of solar energy applications. Solar Energy welcomes manuscripts presenting information not previously published in journals on any aspect of solar energy research, development, application, measurement or policy. The term “solar energy” in this context includes the indirect uses such as wind energy and biomass. Because of the international character of Solar Energy, articles that deal solely with the specific country solar radiation or wind database are not normally considered suitable for Solar Energy. Submitted manuscripts may take the form of reports of original studies or reviews of significant prior work in a given area. All manuscripts are subject to reviews to assure accuracy, clarity, and long-term value. Only English language texts can be accepted. Authors may be members or non-members of ISES. Those who are ISES members should indicate their affiliation on the title page of their manuscript.

Types of Contributions
Solar Energy, the official journal of the International Solar Energy Society® (ISES), is devoted exclusively to the science and technology of solar energy applications. Solar Energy welcomes manuscripts presenting information not previously published in journals on any aspect of solar energy research, development, application, measurement or policy. Submission in the Solar Resources area should consider the editorial Solar Energy 83 (2009) 1-1 that discourages the following submissions:
- Local Solar Resource: Because of the international character of Solar Energy, articles that deal solely with the specific country solar radiation or wind database are not normally considered suitable for Solar Energy.
- Statistical models that convert sunshine duration measurements to solar radiation.
Submitted manuscripts may take the form of reports of original studies or reviews of significant prior work in a given area. All manuscripts are subject to reviews to assure accuracy, clarity, and long-term value. Only English language texts can be accepted. Authors may be members or non-members of ISES®. Those who are ISES® members should indicate their affiliation on the title page of their manuscript. Most of the papers published in Solar Energy are Regular Papers that give in-depth treatment to a particular topic. As a guide, regular papers should be between 4000 and 6000 words (excluding table/figure captions and references). Solar Energy especially encourages review articles for the special issues 'Progress in Solar Energy' and they can far exceed those word limits. Authors must state the number of words in their manuscript at submission stage. However, Solar Energy also publishes Brief Notes (no more than 1500 words or about 3 journal pages). A Brief Note must be a self-contained, small contribution. Often it is a critique or a response to something previously published in Solar Energy. Other times it is a short note describing a modification or enhancement to an existing algorithm or method or results, based on known methods.

BEFORE YOU BEGIN
Ethics in publishing
Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.

Declaration of interest
All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors should complete the declaration of interest statement using this template and upload to the submission system at the Attach/Upload Files step.
Note: Please do not convert the .docx template to another file type. Author signatures are not required. If there are no interests to declare, please choose: 'Declarations of interest: none' in the template. This statement will be published within the article if accepted. More information.

Submission declaration and verification
Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see 'Multiple, redundant or concurrent publication' for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service Crossref Similarity Check.
Use of inclusive language
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

Changes to authorship
Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed. Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

Copyright
Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.

For gold open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (more information). Permitted third party reuse of gold open access articles is determined by the author's choice of user license.

Author rights
As an author you (or your employer or institution) have certain rights to reuse your work. More information.

Elsevier supports responsible sharing
Find out how you can share your research published in Elsevier journals.

Role of the funding source
You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

Open access
Please visit our Open Access page for more information.
Language (usage and editing services)  
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier's Author Services.

Submission  
Submission to this journal proceeds totally online. Use the following guidelines to prepare your article. Via the homepage of this journal (https://ees.elsevier.com/se) you will be guided stepwise through the creation and uploading of the various files. The system automatically converts source files to a single Adobe Acrobat PDF version of the article, which is used in the peer-review process. Please note that even though manuscript source files are converted to PDF at submission for the review process, these source files are needed for further processing after acceptance. All correspondence, including notification of the Editor's decision and requests for revision, takes place by e-mail and via the author's homepage, removing the need for a hard-copy paper trail.

Referees  
Please submit the names and institutional e-mail addresses of several potential referees. For more details, visit our Support site. Note that the editor retains the sole right to decide whether or not the suggested reviewers are used.

PREPARATION  
Peer review  
This journal operates a single blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of two independent expert reviewers to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. More information on types of peer review.

Use of word processing software  
It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

LaTeX  
You are recommended to use the Elsevier article class elsarticle.cls to prepare your manuscript and BibTeX to generate your bibliography. Our LaTeX site has detailed submission instructions, templates and other information.

Article structure  
Subdivision - numbered sections  
Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

Appendices  
If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information  
• Title. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
• **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lowercase superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.

• **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**

• **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

**Highlights**

Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: example Highlights.

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

**Abstract**

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, they must be defined at their first mention in the abstract itself.

**Cover Letter**

Submission of a manuscript must be accompanied by a cover letter that addresses the following requests: What is the novelty of this work? Why the authors think the paper is important and why the journal should publish it? Suggest 3 potential reviewer names for the article, though editors will not feel compelled to use these names. In addition to answering those questions, the authors should also describe in one or two paragraphs the significance of their work and what new information is described in the manuscript.

**Graphical abstract**

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view Example Graphical Abstracts on our information site. Authors can make use of Elsevier’s Illustration Services to ensure the best presentation of their images and in accordance with all technical requirements.

**Keywords**

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

**Abbreviations**

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.
Acknowledgements
Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Formatting of funding sources
List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Math formulae
Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

Footnotes
Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Artwork
Electronic Artwork
General points
• For ease of review all figures must also appear in the text where they are cited.
• Make sure you use uniform lettering and sizing of your original artwork.
• Embed the used fonts if the application provides that option.
• Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
• Number the illustrations according to their sequence in the text.
• Use a logical naming convention for your artwork files.
• Captions to illustrations should not be part of the figure file.
• Size the illustrations close to the desired dimensions of the published version.
• Submit each illustration as a separate file in addition to showing it in the text where it is cited.

A detailed guide on electronic artwork is available on our website: https://www.elsevier.com/artworkinstructions.

You are urged to visit this site; some excerpts from the detailed information are given here.

Formats
If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.
Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):
EPS (or PDF): Vector drawings, embed all used fonts.
TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.
TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.
TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.
Please do not:
• Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
• Supply files that are too low in resolution;
• Submit graphics that are disproportionately large for the content.

Color artwork
Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article. Please indicate your preference for color: in print or online only. Further information on the preparation of electronic artwork.

Figure Captions
Ensure that each illustration has a caption. Show the captions below the figure in the manuscript, but do not attach it to the figure file. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Text graphics
Text graphics may be embedded in the text at the appropriate position. If you are working with LaTeX and have such features embedded in the text, these can be left. See further under Electronic artwork.

Tables
Please submit tables as editable text and not as images. Tables should be placed next to the relevant text in the article. Only if tables are long, consider moving them to an appendix at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules.

References
Citation in text
Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Web references
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

Data references
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

References in a special issue
Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software
Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley. Using citation plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies
will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes from different reference management software.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:
http://open.mendeley.com/use-citation-style/solar-energy

When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

**Reference style**

**Text:** All citations in the text should refer to:
1. **Single author:** the author's name (without initials, unless there is ambiguity) and the year of publication;
2. **Two authors:** both authors' names and the year of publication;
3. **Three or more authors:** first author's name followed by "et al." and the year of publication.

Citations may be made directly (or parenthetically). Groups of references should be listed first alphabetically, then chronologically.

**Examples:**
"as demonstrated (Allan, 1996a, 1996b, 1999; Allan and Jones, 1995). Kramer et al. (2000) have recently shown ...."

**List:** References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication.

**Examples:**
Reference to a journal publication:
Reference to a book:
Reference to a chapter in an edited book:

**Journal Abbreviations**

Elsevier accepts Electronic Annexes material to support and enhance your scientific research. Supplementary files offer the author additional possibilities to publish supporting applications, movies, animation sequences, high-resolution images, background datasets, sound clips and more. Supplementary files supplied will be published online alongside the electronic version of your article in Elsevier Web products, including ScienceDirect: http://www.sciencedirect.com. In order to ensure that your submitted material is directly usable, please ensure that data is provided in one of our recommended file formats. Authors should submit the material in electronic format together with the article and supply a concise and descriptive caption for each file. For more detailed instructions please visit our artwork instruction pages at https://www.elsevier.com/artworkinstructions.

**Research data**

This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the research data page.
Data linking
If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the database linking page.

For supported data repositories a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

Mendeley Data
This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to Mendeley Data. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the Mendeley Data for journals page.

Data in Brief
You have the option of converting any or all parts of your supplementary or additional raw data into one or multiple data articles, a new kind of article that houses and describes your data. Data articles ensure that your data is actively reviewed, curated, formatted, indexed, given a DOI and publicly available to all upon publication. You are encouraged to submit your article for Data in Brief as an additional item directly alongside the revised version of your manuscript. If your research article is accepted, your data article will automatically be transferred over to Data in Brief where it will be editorially reviewed and published in the open access data journal, Data in Brief. Please note an open access fee of 600 USD is payable for publication in Data in Brief. Full details can be found on the Data in Brief website. Please use this template to write your Data in Brief.

MethodsX
You have the option of converting relevant protocols and methods into one or multiple MethodsX articles, a new kind of article that describes the details of customized research methods. Many researchers spend a significant amount of time on developing methods to fit their specific needs or setting, but often without getting credit for this part of their work. MethodsX, an open access journal, now publishes this information in order to make it searchable, peer reviewed, citable and reproducible. Authors are encouraged to submit their MethodsX article as an additional item directly alongside the revised version of their manuscript. If your research article is accepted, your methods article will automatically be transferred over to MethodsX where it will be editorially reviewed. Please note an open access fee is payable for publication in MethodsX. Full details can be found on the MethodsX website. Please use this template to prepare your MethodsX article.

Data statement
To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the Data Statement page.

Full Online Submission
The following list will be useful during the final checking of an article prior to sending it to the journal for review. Please consult this Guide for Authors for further details of any item.

Ensure that the following:
• One author has been designated as the corresponding author with contact details of E-mail address and Full postal address
• Manuscript has been 'spell-checked' and 'grammar-checked'
• References are in the correct format for this journal. All references mentioned in the Reference list are cited in the text, and vice versa
• All figures, tables, and captions are in the body of the manuscript. Figures have legible font
• Permission has been obtained for use of copyrighted material from other sources (including the Internet)
Printed version of figures (if applicable) in color or black-and-white
• Manuscript contains page and line numbers for easy reference by the reviewers.
For any further information please visit our customer support site at https://service.elsevier.com.

AFTER ACCEPTANCE

Offprints
The corresponding author will, at no cost, receive a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier’s Author Services. Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

AUTHOR INQUIRIES
Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.
You can also check the status of your submitted article or find out when your accepted article will be published.

© Copyright 2018 Elsevier | https://www.elsevier.com