Full article for ASIC 2023 must be consisted of:

1. Abstract
2. Introduction
3. Material & Method
4. Results and Discussion
5. Conclusion
6. Acknowledgments
7. References

Note:

Please follow the author guideline part 1 and part 2.

Layout guide for *Journal of Physics: Conference Series* using Microsoft Word

Abstract. All articles *must* contain an abstract. The abstract text should be formatted using 10 point Times or Times New Roman and indented 25 mm from the left margin. Leave 10 mm space after the abstract before you begin the main text of your article, starting on the same page as the abstract. The abstract should give readers concise information about the content of the article and indicate the main results obtained and conclusions drawn. The abstract is not part of the text and should be complete in itself; no table numbers, figure numbers, references or displayed mathematical expressions should be included. It should be suitable for direct inclusion in abstracting services and should not normally exceed 200 words in a single paragraph. Since contemporary information-retrieval systems rely heavily on the content of titles and abstracts to identify relevant articles in literature searches, great care should be taken in constructing both.

1. Introduction

These guidelines, written in the style of a submission to *J. Phys.: Conf. Ser.*, show the best layout for your paper using Microsoft Word. If you don't wish to use the Word template provided, please use the following page setup measurements.

Margin	**A4 ONLY – DO NOT USE US LETTER**
Top	4.0 cm
Bottom	2.7 cm
Left	2.5 cm
Right	2.5 cm
Gutter	0 cm
Header	0 cm
Footer	0 cm

It is *vital* that you **do not add any headers, footers or page numbers to your paper**; these will be added during the production process at IOP Publishing (this is why the Header and Footer margins are set to 0 cm in table 1).

2. Formatting the title, authors and affiliations

Please follow these instructions as carefully as possible so all articles within a conference have the same style to the title page. This paragraph follows a section title so it should not be indented.

2.1. Formatting the title

The title is set 17 point Times Bold, flush left, unjustified. The first letter of the title should be capitalized with the rest in lower case. It should not be indented. Leave 28 mm of space above the title and 10 mm after the title.

2.2. Formatting author names

The list of authors should be indented 25 mm to match the abstract. The style for the names is initials then surname, with a comma after all but the last two names, which are separated by 'and'. Initials should not have full stops—for example **A J Smith** and *not* **A. J. Smith**. First names in full may be used if desired. If an author has additional information to appear as a footnote, such as a permanent

address or to indicate that they are the corresponding author, the footnote should be entered after the surname.

2.3. Formatting author affiliations

Please ensure that affiliations are as full and complete as possible and include the country. The addresses of the authors' affiliations follow the list of authors and should also be indented 25 mm to match the abstract. If the authors are at different addresses, numbered superscripts should be used after each surname to reference an author to his/her address. The numbered superscripts should *not* be inserted using Word's footnote command because this will place the reference in the wrong place—at the bottom of the page (or end of the document) rather than next to the address. Ensure that any numbered superscripts used to link author names and addresses start at 1 and continue on to the number of affiliations. Do not add any footnotes until all the author names are linked to the addresses. For example, to format

J Mucklow[1,3], J E Thomas[1,4] and A J Cox[2,5]

where there are three addresses, you should insert numbered superscripts 1, 2 and 3 to link surnames to addresses and then insert *footnotes* 4 and 5. Note that the first footnote in the main text will now be number 6.

2.3.1. An example. In this example we can see that there are footnotes after each author name and only 5 addresses; the 6th footnote might say, for example, 'Author to whom any correspondence should be addressed.' In addition, acknowledgment of grants or funding, temporary addresses etc might also be indicated by footnotes.

Spin dynamics in geometrically frustrated antiferromagnetic pyrochlores

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3. Formatting the text

The text of your paper should be formatted as follows:

- 11 point Times or Times New Roman.
- The text should be set to single line spacing.
- Paragraphs should be justified.
- The first paragraph after a section or subsection heading should not be indented; subsequent paragraphs should be indented by 5 mm.

4. Sections, subsections and subsubsections

The use of sections to divide the text of the paper is optional and left as a decision for the author. Where the author wishes to divide the paper into sections the formatting shown in table 2 should be used.

4.1. Style and spacing

Table 2. Formatting sections, subsections and subsubsections.

	Font	Spacing
Section	11 point **Times bold**	1 line space before a section No additional space after a section heading
Subsection	11 point *Times Italic*	1 line space before a subsection No space after a subsubsection heading
Subsubsection	11 point *Times Italic*	Subsubsections should end with a full stop (period) and run into the text of the paragraph

4.2. Numbering

Sections should be numbered with a dot following the number and then separated by a single space:

- sections should be numbered 1, 2, 3, etc
- subsections should be numbered 2.1, 2.2, 2.3, etc
- subsubsections should be numbered 2.3.1, 2.3.2, etc

5. Footnotes

Footnotes should be avoided whenever possible. If required they should be used only for brief notes that do not fit conveniently into the text.

6. Figures

Each figure should have a brief caption describing it and, if necessary, a key to interpret the various lines and symbols on the figure.

6.1. Space considerations

Authors should try to make economical use of the space on the page; for example:

- avoid excessively large white space borders *around* your graphics;
- try to design illustrations that make good use of the available space—avoid unnecessarily large amounts of white space *within* the graphic;

6.2. Text in figures

Wherever possible try to ensure that the size of the text in your figures (apart from superscripts/subscripts) is approximately the same size as the main text (11 points).

6.3. Line thickness

In general, try to avoid extremely fine lines (often called ‘hairline’ thickness) because such lines often do not reproduce well when printed out—your diagrams may lose vital information when downloaded and printed by other researchers. Try to ensure that lines are no thinner than 0.25 pt. Note that some illustrations may reduce line thickness when the graphic is imported and reduced in size (scaled down) inside Microsoft Word.

6.4. Colour illustrations

You are free to use colour illustrations for the online version of *Journal of Physics: Conference Series* but any print version will only be printed in black and white **unless special arrangements have been made with your conference organizer for colour printing. Please check with the conference organizer whether or not this is the case.** If any print version will be black and white only, you should check your figure captions carefully and remove any reference to colour in the illustration and

text. In addition, some colour figures will degrade or suffer loss of information when converted to black and white and this should be taken into account when preparing them.

6.5. Positioning figures

Individual figures should normally be centred but place two figures side-by-side if they will fit comfortably like this as it saves space. Place the figure as close as possible after the point where it is first referenced in the text. If there are a large number of figures it might be necessary to place some before their text citation. Figures should never appear within or after the reference list.

6.6. Figure captions/numbering

Captions should be below the figure and separated from it by a distance of 6 points—although to save space it is acceptable to put the caption next to the figure. Figures should be numbered sequentially through the text—'Figure 1', 'Figure 2' and so forth and should be referenced in the text as 'figure 1', 'figure 2',… and not 'fig. 1', 'fig. 2', ….

For captions not placed at the side of the figure, captions should be set to the width of the figure for wider figures, centred across the width of the figure, or, for narrow figures with wide captions, slightly extended beyond the width of the figure. The caption should finish with a full stop (period).

6.6.1. *Examples.* The following examples show how to format a number of different figure/caption combinations. **Note that the table borders are shown as broken lines for guidance only.**



Figure 3. Figure with short caption (caption centred).

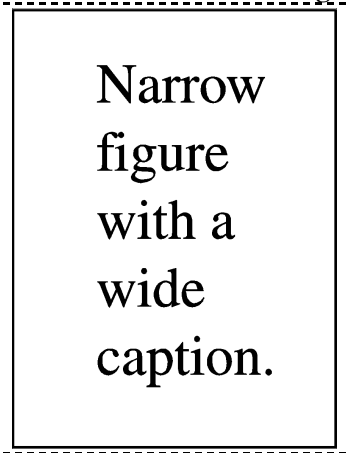


Figure 4. This is a figure with a caption that is wider than the actual graphic. To save space you can put the caption to the right of the figure by placing the graphic and justified caption in a table with one row and two columns.



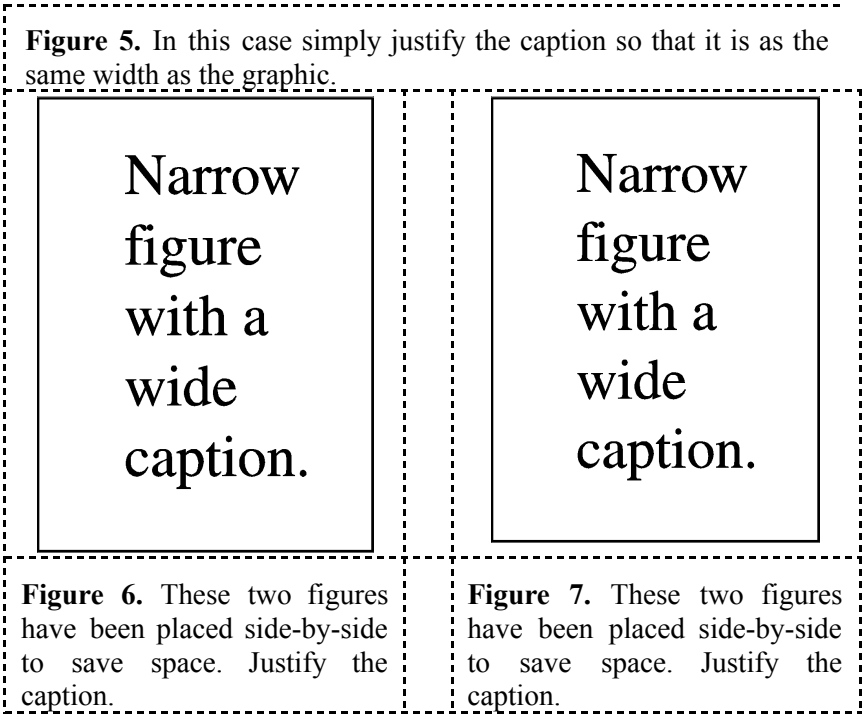


Figure 5. In this case simply justify the caption so that it is as the same width as the graphic.

Figure 6. These two figures have been placed side-by-side to save space. Justify the caption.

Figure 7. These two figures have been placed side-by-side to save space. Justify the caption.

6.7. Figures in parts

If a figure has parts these should be labelled as (a), (b), (c) etc on the actual figure. Parts should not have separate captions.

7. Tables

Note that as a general principle, for large tables font sizes can be reduced to make the table fit on a page or fit to the width of the text.

7.1. Positioning tables

Tables should be centred unless they occupy the full width of the text.

7.2. Tables in parts

If a table is divided into parts these should be labelled (a), (b), (c) etc but there should only be one caption for the whole table, not separate ones for each part.

7.3. Table captions/numbering

Tables should be numbered sequentially throughout the text and referred to in the text by number (table 1, **not** tab. 1 etc). Captions should be placed at the top of the table and should have a full stop (period) at the end. Except for very narrow tables with a wide caption (see examples below) the caption should be the same width as the table.

7.4. Rules in tables

Tables should have only horizontal rules and no vertical ones. Generally, only three rules should be used: one at the top of the table, one at the bottom, and one to separate the entries from the column headings. Table rules should be 0.5 points wide.

7.5. Examples

Because tables can take many forms, it is difficult to provide detailed guidelines; however, the following examples demonstrate our preferred styles.

Table 3. A simple table. Place the caption above the table. Here the caption is wider than the table so we extend it slightly outside the width of the table. Justify the text. Leave 6 pt of space between the caption and the top of the table.

Distance (m)	Velocity (ms^{-1})
100	23.56
150	34.64
200	23.76
250	27.9

7.5.1. More complex tables. The following is a slightly more complex table with a caption that is narrower than the table. Centre the caption across the width of the table. If it is difficult to make a table fit the page, use a smaller font. Headings should normally be in Roman (i.e., not bold or italic) type, have an initial capital and normally align left (but centred sometimes looks better); it is up to the author to choose a layout that is most useful to the reader. Columns of numbers normally align on the decimal point.

Table 4. A slightly more complex table with a narrow caption.

	Wake Chi Sqr. (*N*=15, *df*=1)	*p*	Stage 1 Chi Sqr. (*N*=15, *df*=1)	*p*	Stage 2 Chi Sqr. (*N*=15, *df*=1)	*p*
F3	1.143	0.285	0.286	0.593	0.286	0.593
Fz	1.143	0.285	0.067	0.796	0.067	0.796
C4	2.571	0.109	0.600	0.439	1.667	0.197

Table 5. A slightly more complex table with a caption that is the same width as the table. Simply place the caption inside a row at the top of the table and merge (combine) the cells together so that you have a single table cell the width of the table. Justify the caption.

	Wake Chi Sqr. (*N*=15, *df*=1)	*p*	Stage 1 Chi Sqr. (*N*=15, *df*=1)	p	Stage 2 Chi Sqr. (*N*=15, *df*=1)	*p*
F3	1.143	0.285	0.286	0.593	0.286	0.593
Fz	1.143	0.285	0.067	0.796	0.067	0.796
Cz	1.143	0.285	0.077	0.782	0.286	0.593

7.6. Notes to tables

If you wish to format a table so that it contains notes (table footnotes) to the entries within the body of the table and/or within the table caption, these notes should be formatted using alphabetic superscripts such as [a], [b], [c] and so forth. Notes within the table caption should be listed first. Notes should be placed at the bottom of the table; one convenient method is to create an empty row at the bottom of the table to contain them. Again, merge the cells to give you a single cell the width of the table. Table notes should be 10 point Times Roman. Each note should be on a separate line.

Table 6. A table with headings spanning two columns and containing notes[a].

Nucleus	Thickness (mg cm^{-2})	Composition	Separation energies	
			[redacted], n (MeV)	[redacted], 2n (MeV)
^{181}Ta	19.3±0.1[b]	Natural	7.6	14.2
^{208}Pb	3.8±0.8[c]	99% enriched	7.4	14.1
^{209}Bi	2.6±0.01[c]	Natural	7.5	14.4

[a] Notes are referenced using alpha superscripts.
[b] Self-supporting.
[c] Deposited over Al backing.

8. Equations and mathematics

8.1. Fonts in Equation Editor (or MathType)

Make sure that your Equation Editor or MathType fonts, including sizes, are set up to match the text of your document.

8.2. Points of style

8.2.1. Vectors. Bold italic characters is our preferred style but the author may use any standard notation; for example, any of these styles for vectors is acceptable:

'the vector cross product of $\boldsymbol{a}$ and $\boldsymbol{b}$ is given by $\boldsymbol{a}\times\boldsymbol{b}$ …', or

'the vector cross product of $\mathbf{a}$ and $\mathbf{b}$ is given by $\mathbf{a}\times\mathbf{b}$ …', or

'the vector cross product of $\vec{a}$ and $\vec{b}$ is given by $\vec{a}\times\vec{b}$ …'.

8.2.2. *The solidus (/).* A two-line solidus should be avoided where possible; for example, use

- $\dfrac{1}{M_a}\left(\displaystyle\int_0^\infty d\omega \dfrac{|S_0|^2}{N}\right)^{-1}$ instead of $\dfrac{1}{M_a}\Big/\displaystyle\int_0^\infty d\omega \dfrac{|S_0|^2}{N}$
- $\left(\dfrac{x^2+y^2}{x+y}\right)^{1/2}$ instead of $\sqrt{\left(\dfrac{x^2+y^2}{x+y}\right)}$.

8.2.3. *Roman and italic in mathematics.* Variables should be in italic; however there are some cases where it is better to use a Roman font:

- Use a Roman d for a differential d, for example, $\tan\theta = \mathrm{d}y/\mathrm{d}x$.
- Use a Roman e for an exponential e; for example, $y = \mathrm{e}^x$.
- Use a Roman i for the square root of –1; e.g., $\mathrm{i} = \sqrt{-1}$.
- Certain other common mathematical functions, such as cos, sin, det and ker, should appear in Roman type.
- Subscripts and superscripts should be in Roman type if they are labels rather than variables or characters that take values. For example in the equation

$$\varepsilon_m = -g\mu_n Bm$$

m, the *z* component of the nuclear spin, is italic because it can have different values whereas n is Roman because it is a label meaning nuclear.

8.3. Alignment of mathematics

The preferred style for displayed mathematics in *Journal of Physics: Conference Series* is to centre equations; however, long equations that will not fit on one line, or need to be continued on subsequent lines, should start flush left. Any continuation lines in such equations should be indented by 25 mm. Equations should be split at mathematically sound points, often immediately before =, + or – signs or between terms multiplied together. The connecting signs are not repeated and appear only at the beginning of the turned-over line. A multiplication sign should be added to the start of turned-over lines where the break is between two multiplied terms.

8.3.1. Small displayed equations: Some examples:

$$\phi_k(\vec{r}) = (2\pi)^{2/3} \exp\left(\mathrm{i}\vec{k}\cdot\vec{r}\right) \tag{1}$$

$$A^{(3/2)} = A^{(+)} - A^{(-)} \qquad (I = \tfrac{3}{2}) \tag{2}$$

However, if equations will fit on one line, do so; for example, (5) may also be formatted as:

$$C(12) = \left[\vec{\pi}(x)\cdot\vec{\phi}(x+r)\right] \approx 1 - \text{const}\frac{r^2}{L^2}\int_r^L \frac{x\mathrm{d}x}{x^2} + \cdots \approx 1 - \text{const}\frac{r^2}{L^2}\ln\left(\frac{L}{r}\right) + \cdots \tag{6}$$

8.3.2. *Large display equations: examples.* If an equation is almost the width of a line, place it flush left against the margin to allow room for the equation number.

$$Y(h\nu) = \frac{1}{q}\frac{(h\nu)^2}{[(h\nu_r)^2 - (h\nu)^2]^2 + (\cdots\Delta\omega_{1/2})^2(h\nu)^2}\int_{E\tau - E_V - \Delta\varphi}^{\infty} \frac{[E + (E_v - h\nu)]^{1/2}}{[E + (E_v - E_-)]^{1/2}}\frac{E}{\exp[(E - E_m)/kT] + 1}\mathrm{d}E \tag{7}$$

8.4. Miscellaneous points

- Exponential expressions, especially those containing subscripts or superscripts, are clearer if the notation $\exp(\ldots)$ is used, except for simple examples. For instance, $\exp\left[\mathrm{i}(kx - \omega t)\right]$ and $\exp(z^2)$ are preferred to $\mathrm{e}^{\mathrm{i}(kx-\omega t)}$ and e^{z^2}, but e^2 is acceptable. Similarly the square root sign $\sqrt{\ }$ should only be used with relatively simple expressions, e.g. $\sqrt{2}$ and $\sqrt{a^2 + b^2}$, but in other cases the power $1/2$ should be used.
- It is important to distinguish between $\ln = \log_e$ and $\lg = \log_{10}$.
- Braces, brackets and parentheses should be used in the following order: {[()]}. The same ordering of brackets should be used within each size. However, this ordering can be ignored if the brackets have a special meaning (e.g. if they denote an average or a function).
- Decimal fractions should always be preceded by a zero: for example 0.123 *not* .123 (note, do not use commas, use the decimal point).

- Equations that are referred to in the text should be numbered with the number on the right-hand side.

8.5. Equation numbering

Equations may be numbered sequentially throughout the text (i.e., (1), (2), (3),…) or numbered by section (i.e., (1.1), (1.2), (2.1) ,…) depending on the author's personal preference. In articles with several appendices equation numbering by section is useful in the appendices even when sequential numbering has been used throughout the main body of the text: for example, A.1, A.2 and so forth. When referring to an equation in the text, always put the equation number in brackets—e.g. 'as in equation (2)' or 'as in equation (2.1)'—and always spell out the word 'equation' in full, e.g. 'if equation (5) is factorized'; do not use abbreviations such as 'eqn.' or 'eq.'.

9. Appendices

Technical detail that it is necessary to include, but that interrupts the flow of the article, may be consigned to an appendix. Any appendices should be included at the end of the main text of the paper, after the acknowledgments section (if any) but before the reference list. If there are two or more appendices they should be called appendix A, appendix B, etc. Numbered equations should be in the form (A.1), (A.2), etc, figures should appear as figure A1, figure B1, etc and tables as table A1, table B1, etc.

10. References

As part of the production system for *Journal of Physics: Conference Series*, online versions of all reference lists will, wherever possible, be linked electronically using CrossRef. **It is *vitally* important for all the references to be accurate and to be carefully formatted using the guidelines below, otherwise delays may be incurred and the references may not link through CrossRef**.

A complete reference should provide the reader with enough information to locate the article concerned, whether published in print or electronic form, and should, depending on the type of reference, consist of:

- name(s) and initials;
- date published;
- title of journal, book or other publication;
- titles of journal articles may also be included (optional);
- volume number;
- editors, if any;
- town of publication and publisher in parentheses for *books*;
- the page numbers.

For *Journal of Physics: Conference Series*, please use the Vancouver numerical system where references are numbered sequentially throughout the text. The numbers occur within square brackets, like this [2], and one number can be used to designate several references. The reference list gives the references in numerical, not alphabetical, order.

Points to note

- There should be a 5 mm gap between the reference number (e.g., '[8]') and the start of the reference text. Second and subsequent lines of individual references should be indented by 5 mm. For example:

[1] Aderhold J, Davydov V Yu, Fedler F, Klausing H, Mistele D, Rotter T, Semchinova O, Stemmer J and Graul J 2001 *J. Cryst. Growth* **222** 701

- the authors should be in the form surname (with only the first letter capitalized) followed by the initials with no periods after the initials. Authors should be separated by a comma except for the last two which should be separated by 'and' with no comma preceding it.
- The article title (if given) should be in lower case letters, except for an initial capital, and should follow the date.
- The journal title is in italic and is abbreviated. If a journal has several parts denoted by different letters the part letter should be inserted after the journal in Roman type, e.g. *Phys. Rev*. A. **Please do not join the part letter to the volume number in bold type.**
- Both the initial and final page numbers should be given where possible. The final page number should be in the shortest possible form and separated from the initial page number by an en rule '– ', e.g. 1203–14, i.e. the numbers '12' are not repeated.
- References to printed journal articles. A normal reference to a journal article contains three changes of font (see table 6).

Table 6. Font styles for a reference to a journal article.

Element	Style
Authors, date	Roman type
Article title (optional)	Roman type
Journal title	Italic type
Volume number	Bold type
Page numbers	Roman type

Here are some examples taken from published papers:

[1] Strite S and Morkoc H 1992 *J. Vac. Sci. Technol.* B **10** 1237
[2] Nakamura S, Senoh M, Nagahama S, Iwase N, Yamada T, Matsushita T, Kiyoku H and Sugimoto Y 1996 *Japan. J. Appl. Phys.* **35** L74

10.1.1. References to preprints. For preprints there are two distinct cases:

1. Where the article has been published in a journal and the preprint is supplementary reference information. In this case it should be presented as:

[1] Kunze K 2003 T-duality and Penrose limits of spatially homogeneous and inhomogeneous cosmologies *Phys. Rev.* D **68** 063517 (*Preprint* gr-qc/0303038)

2. Where the only reference available is the preprint. In this case it should be presented as

[1] Milson R, Coley A, Pravda V and Pravdova A 2004 Alignment and algebraically special tensors *Preprint* gr-qc/0401010

10.1.2. References to electronic-only journals. In general article numbers are given, and no page ranges, as most electronic-only journals start each article on page 1.

- For SISSA journals the volume is divided into monthly issues and these form part of the article number

[1] Horowitz G T and Maldacena J 2004 The black hole final state *J. High Energy Phys.* JHEP02(2004)008

10.1.3. *References to books, conference proceedings and reports*. References to books, proceedings and reports are similar to journal references, but have only two changes of font (see table 7).

Table 7. Font styles for references to books, conference proceedings and reports.

Element	**Style**
Authors, Date	Roman type
Book title	Italic type
Editors	Roman type
Place (city, town etc) of publication, publisher	Roman type
Volume, page number	Roman type

Points to note

- Book titles are in italic and should be spelt out in full with initial capital letters for all except minor words. Words such as Proceedings, Symposium, International, Conference, Second, etc should be abbreviated to *Proc*., *Symp*., *Int*., *Conf*., *2nd*, respectively, but the rest of the title should be given in full, followed by the date of the conference and the town or city where the conference was held. For Laboratory Reports the Laboratory should be spelt out wherever possible, e.g. *Argonne National Laboratory Report*.
- The volume number, for example vol 2, should be followed by the editors, in a form such as 'ed A J Smith and P R Jones'. Use *et al* if there are more than two editors. Next comes the town of publication and publisher, within brackets and separated by a colon, and finally the page numbers preceded by p if only one number is given or pp if both the initial and final numbers are given.

Examples taken from published papers:

[1] Sze S M 1969 *Physics of Semiconductor Devices* (New York: Wiley–Interscience)
[2] Dorman L I 1975 *Variations of Galactic Cosmic Rays* (Moscow: Moscow State University Press) p 103
[3] Caplar R and Kulisic P 1973 *Proc. Int. Conf. on Nuclear Physics (Munich)* vol 1 (Amsterdam: North-Holland/American Elsevier) p 517
[4] Szytula A and Leciejewicz J 1989 *Handbook on the Physics and Chemistry of Rare Earths* vol 12, ed K A Gschneidner Jr and L Erwin (Amsterdam: Elsevier) p 133
[5] Kuhn T 1998 Density matrix theory of coherent ultrafast dynamics *Theory of Transport Properties of Semiconductor Nanostructures (Electronic Materials* vol 4*)* ed E Schöll (London: Chapman and Hall) chapter 6 pp 173–214

10.2. Reference lists

Up to ten authors may be given in a particular reference; where there are more than ten only the first should be given followed by *et al*. Abbreviations of the names of periodicals used by IOP Publishing are usually the same as those given in British Standard BS 4148: 1985. If an author is unsure of an abbreviation it is best to leave the title in full. The terms *loc. cit.* and *ibid* should not be used.

Unpublished conferences and reports should generally not be included in the reference list and articles in the course of publication should be entered only if the journal of publication is known. A thesis submitted for a higher degree may be included in the reference list if it has not been superseded by a published paper and is available through a library; sufficient information should be given for it to be traced readily.

Acknowledgments
Authors wishing to acknowledge assistance or encouragement from colleagues, special work by technical staff or financial support from organizations should do so in an unnumbered Acknowledgments section immediately following the last numbered section of the paper.