



# National Optical Astronomy Observatory (NOAO)

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## **Style Guide**

*NOAO Newsletter* and NSF Reports

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## Quick Reference Guide for NSF Reports

### Abbreviations

### Spelling

### Images

#### Captions

- Provide concise captions to describe what the image represents.
- Number images if more than one in the article.
- Examples: *Figure 1. Concise description. (Image credit: J. Price/NOAO/AURA/NSF.)*  
*Figure 2. Concise description. (Image credit: Muñoz et al. 2015, ApJ, 815, L1.)*

#### Image Files

- Acceptable formats are EPS, PNG, TIF, JPG, GIF, PDF.
- Provide separate (not imbedded in text) high-resolution image files.
- Images must be 1200 x 800 pixels or larger.
- If image is from a published article, check the publisher's requirements for permission requirements and add a "permission" comment to the credit line as directed.

#### Text References

*Examples:* See Figure 2; As shown in Table 1; The orbit was variable (Figure 1).

### Names, Personal

- Avoid naming specific NOAO staff when possible; if necessary, use "first initial last name."
- Use spaces between initials: K. H. Hunt
- Principal investigator references: PI: J. Smith
- Non-NOAO staff: Use full name without title and degree. Add affiliation after name in parentheses. Example: F. Fekel (Tennessee State University)
- Use a formal voice and avoid the use of first person pronouns.
- Write from the standpoint of the third person, limiting the use of third person pronouns. Refer instead to a department, program, or group name and/or use the words "staff" or "employees." The report needs to sound as though only one person wrote it.
- References to the "reader" should not be necessary.

### References

- Text examples:  
(Ryan 2014; Mann et al. 2015; Smith and Jones 2015)  
We found two new binary stars (Smith and Jones, 2015, MNRAS, 52, 415).  
Hui et al. (2015, MNRAS, 446, 842) found a new binary star.  
Smith published "The Binary Stars" (2015, ApJ, 781, 82) earlier this year.

### Word Count

- 1 page, Calibri, 11 pt = (approx.)  
With two 2.5 × 2.5 images and captions: 300 words, 2000 characters with spaces  
Without image: 550 words; 3400 characters with spaces

## Quick Reference Guide to Colons, Commas, and Semicolons

### Colon

- Use before a quotation longer than one line.  
*Example:* According to Dr. Page: "The government goofed again. It failed to review the matter."
- May be used between two sentences when the second sentence explains or expands upon the first sentence.  
*Example:* She got what we worked for: she earned a promotion.
- Use after a complete sentence to introduce a list.  
*Example:* I must remember to bring my things to the party: food, drink, fork.
- Do not use after an incomplete sentence before a list. This sentence is incorrect: I must remember to bring my things to the party including: food, drink, fork. = I must remember to bring my things to the party including food, drink, and fork.

### Semicolon

- Use between two closely linked sentences.
- Use to separate units of a series when one or more of the units contain commas.  
*Example:* The conference was attended by individuals from Moscow, Idaho; California; Tucson, Arizona; and other places.
- Use before conjunctive adverbs (however, therefore, that is, for example) when they introduce a complete sentence.  
*Example:* I wanted to go to Mars; however, the spacecraft was already full.

### Commas

#### Use a comma

- before “and” in a series (Blanco, **Mayall**, and SOAR);
- between a city name and state name or a city name and country name (Kitt Peak is located in Tucson, **Arizona**, south of Phoenix)
- in numbers of 4 or more digits in non-science uses (3,270 miles; 1,000,111 individuals)
- before “which”; this relative pronoun introduces a nonrestrictive clause that provides supplementary information not essential to define the word or clause referred to by “which.” *Example:* The Mosaic filters include the VR **filter, which** has an especially broad band-pass.

#### Do *not* use a comma

- in four-digit number in science uses (**6700** square degrees)
- before “that”; this relative pronoun introduces a restrictive clause essential to the meaning of the sentence to properly identify or define the word or clause referred to by “that.” *Example:* For the deepest surveys, you should use the Mosaic **filter that** has the broadest band-pass.

## Quick Reference Guide for NOAO Newsletter

### Abbreviations

### Spelling

### Images

#### Captions

- Provide concise captions to describe what the image represents.
- Number images if more than one in the article.
- Examples: *Figure 1. Concise description. (Image credit: J. Price/NOAO/AURA/NSF.)*  
*Figure 2. Concise description. (Image credit: Muñoz et al. 2015, ApJ, 815, L1.)*

#### Image Files

- Acceptable formats are EPS, PNG, TIF, JPG, GIF, PDF.
- Provide separate (not imbedded in text) high-resolution image files.
- Images must be 1200 x 800 pixels or larger.
- If image is from a published article, check the publisher's requirements for permission requirements and add a "permission" comment to the credit line as directed.

#### Text References

*Examples:* See Figure 2; As shown in Table 1; The orbit was variable (Figure 1).

### Names, Personal

- Use people's names without a title or degree. (J. Smith)
- In a Science Highlights article, use the last name only in second and subsequent references.
- In an article other than in Science Highlights, use the first name only in second and subsequent (unless it would be confused with someone else in the article).
- Articles may be written in the first person ("I," "we," "my," "our," "me," "us").
- References to the reader may be in the second person ("you," "your").

### References

- In sections other than Science Highlights, use full citation in body of article.
- Science Highlights
  - Text
    - 1 author: Smith (2007) OR (Smith 2007)
    - 2 authors: Smith and Jones (2008) OR (Smith and Jones 2008)
    - 3 authors: Smith, Jones, and Ryan (2010) OR (Smith, Jones, and Ryan 2010)
    - 4 or more authors: Connors et al. (2011) OR (Connors et al. 2011)
    - 2 or more papers in same reference: (Smith 2008; Towne 20007)
  - References (at end of article):
    - 1 author: Smith, A. B. 2007, arXiv:0702.1234
    - 2 authors: Smith, M. R. and Jones, S. Q. 2008, ApJ, 492, 111
    - 3 authors: Smith, M. R., Jones, S. R., and Ryan, N. C. 2010, AJ, 444, 22
    - 4 or more authors: Connors, M., et al. 2011, Natur, 475, 481
  - Papers with the same author(s) and years: Smith 2008a; Smith 2008b, etc.

## Abbreviations

- See this Style Guide’s *Abbreviations*.
- Write out all names in full on their first appearance followed by the abbreviation in parentheses. Use the abbreviation in the remainder of text.  
*Example:* The National Optical Astronomy Observatory (NOAO) is the national center for ground-based nighttime astronomy in the United States. Visit the NOAO website ([www.noao.edu](http://www.noao.edu)) for information on our programs.
- Spell out “University” the first time and then abbreviate as “U.”  
*Example:* The instrument was developed at the University of Florida. The principal investigator was Richard Jones (U. Florida).
- Use “the” or “a/an” only before an abbreviation that cannot be pronounced as a word.  
*Examples:* We contacted ESO to inquire about the IAU.  
We are interested in ALMA as well as in the VLT.

## Accent Marks

*Note:* A “+” in the table below indicates that you must press the specified keys *together*. A comma indicates that you press the specified keys *separately*.

*Example:* For è on a Windows machine, press Ctrl key together with ` key; release; press “e” key

	Windows	Mac
Letter/Symbol	Shortcut Key Combination	Shortcut Key Combination
à, è, ì, ò, ù, À, È, Ì, Ó, Û	Ctrl + ` (accent grave), the letter	Option + ` (accent grave), the letter
á, é, í, ó, ú, ý, Á, É, Í, Ó, Ú, Ý	Ctrl + ' (apostrophe), the letter	Option + e, the letter
â, ê, î, ô, û, Â, Ê, Î, Ô, Û	Ctrl + Shift + ^ (caret), the letter	Option + i, the letter
ã, ñ, õ, Ã, Ñ, Õ	Ctrl + Shift + ~ (tilde), the letter	Option + n, the letter
ä, ë, ï, ö, ü, ý, Ä, Ë, Ì, Ö, Ü, Ý	Ctrl + Shift + : (colon), the letter	Option + u, the letter
â, Å	Ctrl + Shift + @, a or A	Option + a or Option + A
æ, Æ	Ctrl + Shift + &, a or A	Option + ' (apostrophe) OR Option + Shift + ' (apostrophe)
œ, Œ	Ctrl + Shift + &, o or O	Option + q OR Option + Shift + q
ç, Ç	Ctrl + , (comma), c or C	Option + c or C
ð, Ð	Ctrl + ' (apostrophe), d or D	
ø, Ø	Ctrl + /, o or O	Option + o
ı	Alt + Ctrl + Shift + ?	Option + Shift + ?
ı	Alt + Ctrl + Shift + !	Option + !
ß	Ctrl + Shift + &, s	Option + s



## Adjectives, Compound

- For compound adjectives before nouns, use a hyphen only if necessary for clarification.
- Do not hyphenate a compound adjective when the first word ends in “ly.”  
*Example:* She is a highly competent employee.
- See this Style Guide’s Spelling *section* for the capitalization of specific terms. Consult a dictionary for terms not found in the Spelling list.

## Capitalization

### General Guidelines

- See this Style Guide’s Spelling *section* for the capitalization of specific terms.
- Capitalize all proper nouns.
- For individual or institutional names, follow the convention of the individual or institution.

### Categories

- Conferences/Meetings/Workshops: the 228<sup>th</sup> Annual Meeting of the American Astronomical Society; “Exoplanets and Planet Formation”

### Section Headings and Article Titles

#### Capitalize

first and last words in titles and subtitles  
all nouns, pronouns, adjectives, verbs, and adverbs

#### Lowercase

articles (a, an, the)  
conjunctions (and, but, or, nor)  
prepositions (above, in)

#### Hyphenated Words

Always capitalize the first element.  
Capitalize the second element UNLESS it is an article, conjunction, or preposition OR the first element is a prefix.

#### *Examples:*

A Run-in with the Boss  
Twenty-Two  
Back-and-Forth  
High-Status Job  
Time-Sensitive Material  
Anti-intellectual  
Pre-order

## Commas

### Use a comma

- before “and” in a series (Blanco, **Mayall**, and SOAR);



- between a city name and state name or a city name and country name (Kitt Peak is located in Tucson, **Arizona**, south of Phoenix)
  - in numbers of 4 or more digits in non-science uses (3,270 miles; 1,000,111 individuals)
  - before “which”; this relative pronoun introduces a nonrestrictive clause that provides supplementary information not essential to define the word or clause referred to by “which.” Example: The Mosaic filters include the VR **filter**, **which** has an especially broad band-pass.
- Do *\*not\** use a comma
- in four-digit number in science uses (**6700** square degrees)
  - before “that”; this relative pronoun introduces a restrictive clause essential to the meaning of the sentence to properly identify or define the word or clause referred to by “that.” *Example:* For the deepest surveys, you should use the Mosaic **filter that** has the broadest band-pass.

## Dashes & Hyphens

### Hyphen

- -
- Used to connect two words in text, such as compound adjectives (ground-based astronomy) and nouns (one-off).
- Used in non-inclusive numbers such as phone numbers (318-8475).
- Used before “mid” when followed by word starting with a capital letter (mid-April).
- *See also* this Style Guide’s *Adjectives, Compound section* for guidance on hyphenating compound adjectives.
- *See also* this Style Guide’s Spelling *section* and a dictionary for hyphenation of specific terms.

### En-dash

- –
- Used to separate ranges of numbers and dates (May–August; 114–251)
- Used to indicate a minus sign (–2)

### Em-dash

- —
- Used to indicate a break in thought
- Used before a phrase that emphasizes or provides further explanation of the main clause in a sentence
- No spaces before or after em-dash
- *Examples:*
- The house was very solid—and not just because it was made of stone.



- The instrument—damaged severely in transit—is not available for the coming semester.

## Dates

- Centuries: 20th century (“th” not superscript)
- Decades: the 1990s (no apostrophe)
- Months: September, March, February (spell out in text); in tables/forms with days, months, and years, use abbreviations: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec (17-Sep-17)
- Specific Dates: 25 June 2015; 15–16 February 2015; May 2010; December 25; 1 March–2 April 2008; May–June
- Fiscal years – quarters: FY17 Q1; FY18 Q2

## Foreign Names/Words

- Foreign words that have not been commonly accepted into English are placed in italics. See this Style Guide’s Spelling *section* for specific terms. For terms not in this Style Guide, consult a dictionary.
- Proper names in foreign languages are capitalized and in roman type.
- *See also* this Style Guide’s *Accent Marks section* and *Institutional Names section*.

## Formatting

- Margins: 1-inch
- Font: Times New Roman
- Type Size: 12 point (NOAO Newsletter); 11 point (NSF Reports)
- Orientation: Portrait

## Greek Letters

Greek letters may be used in any section of the *NOAO Newsletter* and in NSF Reports.

*Example:* “H $\alpha$ ” instead of “H-alpha”

**Hyphens.** *See Dashes & Hyphens.*

## Images

### Captions

- Provide concise captions to describe what the image represents.
- Number images for *Newsletter* article if more than one in the article.

- Place credit line at end of caption: (Initial of first name Last name/Affiliation.)
- Examples:
  - *Figure 1. Concise description. (Image credit: J. Price/NOAO/AURA/NSF.)*
  - *Figure 2. Concise description. (Image credit: Muñoz et al. 2015, ApJ, 815, L1.)*

### Charts/Graphs/Tables

- Axis labels and symbols should be readable.
- Provide separate (not imbedded in text), high-resolution image files.

### Images

- Acceptable formats are EPS, PNG, TIF, JPG, GIF, PDF.
- Provide separate (not imbedded in text) high-resolution image files.
- Images must be 1200 x 800 pixels or larger.
- If image is from a published article, check the publisher's requirements and be sure that permission has been obtained. Add a "permission" comment to the credit line as directed by the publisher.

### Text References

*Examples:* See Figure 2; As shown in Table 1; The orbit was variable (Figure 1).

## Institutional Names

- Spell out an institution's name at first occurrence and follow with the abbreviation in parentheses (if there will be subsequent references). Use the abbreviation for all subsequent references.
- Spell out "University" the first time and then abbreviate as "U." (example: University of Florida; U. Florida)

#### Foreign Institutions:

Aarhus University (or Aarhus Universitet)  
Agenzia Spaziale Italiana  
Argelander-Institut für Astronomie  
Astronomický ústav  
Astrophysikalisches Institut Potsdam  
Australian National University  
Brandon University  
Byurakan Astrophysical Observatory  
Centre d' Etude Spatiale des Rayonnements  
Centre National de la Recherche  
Scientifique  
Centro de Astrobiología  
Centro de Investigaciones de Astronomía  
Centro de Radio Astronomia e Aplicações

Charles University, Prague  
Chubu University  
Città Universitaria  
College of New Caledonia  
Commissariat à l'Énergie Atomique  
Consejo Superior de Investigaciones  
Científicas  
Deutschen Zentrum für Luft- und  
Raumfahrt  
Dr. Remeis-Sternwarte Bamberg (the  
Astronomical Institute of the University  
of Erlangen-Nuremberg)  
Eberhard Karls Universität, Tübingen  
École Polytechnique de Lausanne



Eldgenössische Technische Hochschule	Istituto di Radioastronomia
Escuela Intermedia Sabana Llana	Istituto di Radioastronomia, Bologna, CNR
Ewha Womans University	Istituto Nazionale di Astrofisica: Istituto
Facultad de Ciencias	Nazionale di Astrofisica–Osservatorio
Friedrich-Schiller-Universität, Jena	Astrofisico di Catania; Istituto
Fundació Observatori Esteve Duran	Nazionale di Astrofisica–Telescopio
Hamburger Sternwarte	Nazionale Galileo
Heidelberg University	Iwate University
Heidelberg-Königstuhl Landessternwarte	Jagiellonian University
Herzberg Institute of Astrophysics	Justus-Liebig-Universität Giessen
Inst. Astrofísica de Andalucía (IAA)	Katholieke Universiteit Leuven (KU
Inst. of Space & Astronautical Science	Leuven)
Institut d'Astrophysique et de Géophysique	Kiepenheuer-Institut für Sonnenphysik
Institut d'Astrophysique de Paris	Kiev State University
Institut d'Astrophysique Spatiale	L'Observatoire de Nice
Institut de Ciències de L'Espai	Laboratoire d'Astronomie Spatial de
Institut de Planétologie et d'Astrophysique	Marseilles
de Grenoble	Laboratoire d'Astrophysique de Bordeaux
Institut de RadioAstronomie Millimétrique	Laboratoire d'Astrophysique de Grenoble
Institut für Astronomie, Zurich	Laboratoire d'Astrophysique de Marseille
Institut für Theoretische Astrophysik	Laboratoire de Photophysique Moléculaire
Potsdam	Laboratoire de Physique Moléculaire et
Institute for Theoretical Physics	Atmosphérique
Institute of Astronomy, University of	Laboratorio di Radioastronomia
Tokyo	Laboratório Nacional de Astrofisica
Institute of Experimental Physics	Laval University
Institute of Radioastronomy C.N.R.	Leibniz-Institut für Astrophysik
Instituto (de) Astrofisco de Andalucía	Liverpool John Moores University
Instituto de Astrofísica de Canarias	Ludwig-Maximilians Universität-München
Instituto de Astronomía	Macquarie University
Instituto de Astronomia, Geofísica e	Max-Planck-Institut für Astronomie
Ciências Atmosféricas	Max-Planck-Institut für Astrophysik
Instituto de Estructura de la Materia	Max-Planck-Institut für extraterrestrische
Instituto de Matemáticas y Física	Physik
Fundamental	Max-Planck-Institut für Kernphysik
Inter-University Centre for Astronomy and	Heidelberg
Astrophysics	Max-Planck-Institut für Radioastronomie
International Centre for Theoretical Physics	McGill University
International Space University	McMaster University
Istituto Astronomico	Monash University
Istituto de Astrofisica Spaziale	National Astronomical Observatory
Istituto de Astronomia, Firenze	National Central University
Istituto de Fisica Cosmica CNR	Observatoire astronomique de Strasbourg
Istituto di Fisica Cosmica e Tecnologie	Observatoire de Besançon
Istituto di Fisica dello Spazio	Observatoire de la Côte d'Azur
Interplanetario	Observatoire de Midi-Pyrenees

Observatoire de Paris	Università degli Studi di Ferrara
Observatoire de Pic-du-Midi	Università degli Studi di Padova
Observatoire de Strasbourg	Università degli Studi di Roma Tor Vergata
Observatoire Royal de Belgique	Universität Bonn
Observatorio Astrofísico Guillermo Haro	Universität Heidelberg
Observatorio Astronómia Nacional	Universität Kiel
Observatorio Astronómico de Córdoba	Universität Münster
Observatório Astronómico de Lisboa	Universität Potsdam
Observatorio Astronómico F. Aguilar	Universität Wien
Observatorio Astronómico Nacional	Universitäts-Sternwarte München
Observatório do Valongo	Université de Liège
Observatorio Nacional Brazil	Université de Reims Champagne-Ardenne
Odessa State University	Université de Strasbourg
Open University	Université Libre de Bruxelles
Osservatorio Astrofisico di Arcetri	University of Alberta
Osservatorio Astrofisico di Torino	University of Birmingham
Osservatorio Astronomico di Brera	University of Cambridge
Osservatorio Astronomico di Padova	University of Canterbury
Osservatorio Astronomico di Roma	University of Durham
Osservatorio Astronomico di Trieste	University of Edinburgh
Pontificia Universidad Católica de Chile	University of Exeter
Queen's University Belfast	University of Groningen
Radboud University Nijmegen	University of Hertfordshire
Service d'Aéronomie du CNRS	University of Leicester
Service d'Astrophysique	University of Manchester
Swinburne University	University of Melbourne
The Hebrew University	University of Montreal
Thüringer Landessternwarte Tautenberg	University of Oxford
Universidad Autónoma de Madrid	University of Portsmouth
Universidad Católica del Norte	University of Sheffield
Universidad de Cantabria	University of Southampton
Universidad de Concepción	University of St. Andrews
Universidad de Valparaíso	University of Sydney
Universidad del País Vasco	University of Toronto
Universidad Nacional de la Plata	University of Victoria
Universidade Cruzeiro do Sul	University of Warwick
Universidade Federal de Santa Maria	Warsaw University Observatory
Universidade Federal do Rio Grande do Norte	Weizmann Institute of Science
Universidade Federal do Rio Grande do Sul	York University
Università degli Studi di Bologna	Zentrum für Astronomie der Universität Heidelberg

## Italics

- Book titles: *Coloring the Universe*



- Journal names: *Astronomical Journal*
- Non-English-language words that have not been commonly accepted into English are italicized. See this Style Guide's Spelling *section* for specific terms. For terms not in this Style Guide, consult a dictionary; non-English-language terms found in the dictionary are not italicized.

## Journal Names and Abbreviations

*A&A – Astronomy and Astrophysics*  
*A&AR – The Astronomy and Astrophysics Review*  
*A&AS – Astronomy and Astrophysics Supplement Series*  
*Afz – Astrofizika*  
*AJ – The Astronomical Journal*  
*ApJ – The Astrophysical Journal*  
*ApJL – The Astrophysical Journal Letters*  
*ApJS – The Astrophysical Journal Supplement Series*  
*Ap&SS – Astrophysics and Space Science*  
*ARA&A – Annual Review of Astronomy and Astrophysics*  
*BAAS – Bulletin of the American Astronomical Society (AAS Meetings)*  
*JA&A – Journal of Astrophysics and Astronomy*  
*MNRAS – Monthly Notices of the Royal Astronomical Society*  
*PASJ – Publications of the Astronomical Society of Japan*  
*PASP – Publications of the Astronomical Society of the Pacific*  
*QJRAS – Quarterly Journal of the Royal Astronomical Society*  
*RevMexAA – Revista Mexicana de Astronomia y Astrofisica*

## Lists, Vertical

Ensure that each element of the list is in the same format and follows consistently from the lead-in statement.

Complete sentence (begin list with capital letter; end with punctuation)

We made the following observations:

- The star exploded in space.
- The aliens escaped.

Incomplete sentence (begin list with lowercase letter; end with period; use semicolons within list)

I observed the following objects:

- pen;
- paper;
- Saturn;
- a space shuttle.

## Measurements

- Abbreviations vs. symbols: Use symbols if no confusion is possible; otherwise use abbreviations.



- Adjectives: 4m telescope; 40-second clock
- Angstroms = Å
- Arcminute: “arcmin” instead of symbol [‘]
- Arcsecond: “arcsec” instead of symbol [“]
- Degrees: 90°
- Metric system: use as much as possible
- Space between measure and unit (7 μm; 12 GHz; 12 Mps)
- Telescopes: 4m; 200 in

## Names, Personal

### NOAO Newsletter

- Use people’s names without a title or degree. (J. Smith)
- In second and subsequent references to an individual in a Science Highlights article, use the last name only.
- In second and subsequent references to an individual in sections other than Science Highlights, use the first name only (unless it would be confused with someone else in the article).
- Articles may be written in the first person (“I,” “we,” “my,” “our,” “me,” “us”).
- References to the reader may be in the second person (“you,” “your”).

### NSF Reports

- Avoid naming specific NOAO staff when possible; if necessary, use “first initial last name.”
- Use spaces between initials: K. H. Hunt
- Principal investigator references: PI: J. Smith
- Non-NOAO staff: Use full name without title and degree. Add affiliation after name in parentheses. Example: F. Fekel (Tennessee State University)
- Use a formal voice and avoid the use of first person pronouns.
- Write from the standpoint of the third person, limiting the use of third person pronouns. Refer instead to a department, program, or group name and/or use the words “staff” or “employees.” The report needs to sound as though only one person wrote it.
- References to the “reader” should not be necessary.

## Numbers/Numerals

See also this Style Guide’s *Measurements section*.

- Abbreviations: 4 g; 35 kg (use Arabic numerals)
- Adjectives: 15-year-old telescope
- Apertures:  $f/8$  aperture (use Arabic numerals and  $f$  symbol)
- CCD formats: 8K × 8K
- Centuries: 14th century, 20th century



- Dimensions:  $10 \times 15$
- Formulas: Use Arabic numerals
- Fractions: one-eighth portion (use hyphen)
- Ionization values: He II, [O III]
- Large numbers: With four or more digits to left of decimal point, use a comma separator or use scientific notation. This also applies to “R” units for spectral resolution.
- Math symbols: No space between symbol (i.e.,  $\sim$ ,  $+$ , etc.) and number, unless part of an equation ( $\sim 100$ )
- Numbers  $\leq$  nine: Spell out (one, two)
- Numbers  $\geq$  10: Use Arabic numerals (10, 251)
- Ordinal numbers: 23rd (no superscripts)
- Percents: Arabic numeral and percent sign (15%)
- Ranges (inclusive): Use en-dash (–)

## Punctuation

### Apostrophes

- Use to indicate possession.  
*Examples:* singular nouns: Smith’s, Jones’s  
plural nouns: cars’; United States’
- Do not use in abbreviations: CDs
- Do not use in decades: 1980s

### Colon

- Use before a quotation longer than one line.
- May be used between two sentences when the second sentence explains or expands upon the first sentence.  
*Example:* She got what we worked for: she earned a promotion.
- Use after a complete sentence to introduce a list.  
*Example:* I must remember to bring my things to the party: food, drink, fork.
- Do not use after an incomplete sentence before a list. This sentence is incorrect: I must remember to bring my things to the party including: food, drink, fork. = I must remember to bring my things to the party including food, drink, and fork.

### Semicolon

- Use between two closely linked sentences.
- Use to separate units of a series when one or more of the units contain commas. *Example:* The conference was attended by individuals from Moscow, Idaho; California; Tucson, Arizona; and other places.
- Use before conjunctive adverbs (however, therefore, that is, for example) when they introduce a complete sentence.  
*Example:* I wanted to go to Mars; however, the spacecraft was already full.



## Spaces

- Use one space between sentences in NSF Reports.
- Use two spaces between sentences in *NOAO Newsletter*.

## Redundant Redundancies

- Avoid unnecessary words and phrases unless needed for clarity. In the following examples, you should remove the words in square brackets.
  - I studied the Moon [in order] to determine its orbit.
  - [absolutely] necessary
  - [absolutely] essential
  - attach [together]
  - [brief] summary
  - [completely] eliminate
  - connect [together]
  - crisis [situation]
  - each [and every]
  - [end] result
  - [final] outcome
  - outside [of]
  - whether [or not]

In *NOAO Newsletter* articles, avoid starting articles with phrases such as “As you know,” “As we said before,” and “As you may recall.” The classic newspaper style of leading with a few strong declarative sentences that get the main point of the article instantly in front of the reader is preferred.

## References

### *NOAO Newsletter*

- In sections other than Science Highlights, use full citation in body of article. Do not include in captions.
- Science Highlights
  - Text
    - 1 author: Smith (2007) OR (Smith 2007)
    - 2 authors: Smith and Jones (2008) OR (Smith and Jones 2008)
    - 3 authors: Smith, Jones, and Ryan (2010) OR (Smith, Jones, and Ryan 2010)
    - 4 or more authors: Connors et al. (2011) OR (Connors et al. 2011)
    - 2 or more papers in same reference: (Smith 2008; Towne 20007)
  - References (at end of article):
    - 1 author: Smith, A. B. 2007, arXiv:0702.1234
    - 2 authors: Smith, M. R. and Jones, S. Q. 2008, ApJ, 492, 111
    - 3 authors: Smith, M. R., Jones, S. R., and Ryan, N. C. 2010, AJ, 444, 22



- 4 or more authors: Connors, M., et al. 2011, *Natur*, 475, 481
- Papers with the same author(s) and years: Smith 2008a; Smith 2008b, etc.
- Wolk, S. J., & Walter, F. M. 1999, *AJ*, submitted
- Wolk, S. J., & Walter, F. M. 1999, *AJ*, in press

### NSF Reports

- Text examples:
  - (Ryan 2014; Mann et al. 2015; Smith and Jones 2015)
  - We found two new binary stars (Smith and Jones, 2015, *MNRAS*, 52, 415).
  - Hui et al. (2015, *MNRAS*, 446, 842) found a new binary star.
  - Smith published “The Binary Stars” (2015, *ApJ*, 781, 82) earlier this year.

### Special Characters

- $M_{\text{sun}} = M_{\odot}$
- $\times$  (multiplication sign)

### Spelling

See also this Style Guide’s *Abbreviations*.

90Prime (Bok telescope)	Bosque Fray Jorge National Park
a.m.	break up (verb)
Abu (infrared camera)	breakup (adj.)
ad hoc	bright-time
Adaptive Optics Roadmap	broadband
Aladdin	build-up
alt-az	Burrell Schmidt telescope
Altair	Call for Proposals
arcmin	Cassegrain
arcminute	Celcius
arcsec	Cerro Pachón
arcsecond	Chandra X-ray Observatory
Astro2010 Decadal Survey	clean room
Astronomy Night at the White House	co-author
ATST Project	co-spatial
backscatter	coelostat
backup	cooldown
baseline	cost-effective (adj.)
beam splitter	Coudé Feed
Big Bang	Coudé Room
binarity	cross-calibration
birthline	Crosstalk (electronics term)
Boötes	Curtis Schmidt telescope
Bok Telescope	data (plural noun)



database	GEMINI (software package)
dataset/s	Gemini Director
Daytime	Gemini North
decadal survey (but capitalize when part of proper name)	Gemini Observatory
Deep Wide-Field Survey (NDWFS) (use abbreviation on second and subsequent text references)	Gemini Partnership
delivered image quality	Gemini South
Demonstration Science	GMOS-North
Dewar	GMOS-South
diffraction-limited (adj.)	GNIRS Team
digital archive	go-ahead
dimensional: 2-D; 3-D	grayscale
Doppler	grism
Dunn Solar Telescope	ground-based (adj.)
e.g.,	guide star
Earth (not “the Earth”)	Gyr
east (direction); east wing	Haleakalā
echelle	hard copy
eduroam	hard wired (verb); hardwired (adj.)
eigenprofile(s)	Ha:sañ Preparatory & Leadership School
El Peñón	hemisphere: Northern Hemisphere; Southern Hemisphere
electro-mechanical	high energy physics
electro-optical	high-resolution (adj.)
email	home page
et al.	HTML
etalon	i.e.,
etc.,	image cutout service (Data Lab)
Evershed effect	in situ
extrasolar planet	infrared (spell out on first occurrence; use IR in second and subsequent text references)
Fahrenheit or F (212° F or 212° Fahrenheit)	input
fall (season)	Instrument Support Box (ISB) – SOAR telescope
far-infrared	pintergalactic
farside	internet (per CMS 17)
federal	Iolkam Duag
fiber optics	IR
fiber-optic	iSHELL
field-of-view (adj.); field of view (noun)	IYA2009
flat-fielding	James Webb Space Telescope
follow-up (noun and adj.); follow up (verb)	JPEG
ftp	Jupyter
FWHM	Keck telescopes: Keck I; Keck II
FY 2003; FY03	Kelvin
Galactic	Kitt Peak Observers’ Information web page
Galactic Center	Kitt Peak Visitor Center (KPVC)
Galaxy	kpc
gamma-ray astronomy	
Gauss (unit)	
Gaussian	



Kuiper Belt object	narrowband
LabVIEW	Nasmyth
lake, the Kitt Peak	Near-Earth object (NEO)
large-scale (adj.)	near-infrared
light-curve(s)	near-infrared (also near-IR or NIR, hyphenate as adj, spell out first occurrence)
light-year(s)	NEWFIRM (use “the NEWFIRM wide- field infrared imager” on first reference)
local universe	nighttime
long-duration exposure (n.)	<i>NOAO Currents</i>
long-slit	NOAO director; NOAO Director Joe Smith
long-term (adj.)	NOAO North; NOAO-N
LONGSLIT	NOAO South; NOAO-S
lookup	NOAO Tucson
low frequency waves	nod-and-shuffle mode
low-order	non (in compound terms, generally do not use hyphen, e.g., nonlinear; but, non- survey)
lowercase	North (direction)
Magellan telescopes	notch filter
magnetogram(s)	NSF (use on first and all subsequent occurrences)
magnitude-limited (adj.)	OIR (optical/infrared, spell out first occurrence; use abbreviation on second and subsequent text references)
Maunakea	off-axis
Mayall 4m telescope	on-axis
McMath-Pierce facility; McMath-Pierce Solar Telescope; McMath-Pierce	on-site (adj.)
medium-resolution (adj.)	onboard (adj.)
megayear	online (noun, adj.)
metal-rich, metal-poor (adj.)	open-access (adj.)
Michelle (Gemini mid-infrared imager)	optical/infrared
micromirror	optomechanical
mid- (when followed by proper noun as in mid-June; most compound adjectives do not require hyphen as in midyear)	overspeed
mid-infrared (spell out on first occurrence; use mid-IR on second and subsequent text references)	p.m.
Mini-200	parameter
MMT	Parque Nacional Bosque Fray Jorge
Moon	pc
Mosaic 1.1	PDF
Mosaic-3	Phase I Tool
Mosaic camera(s)	Phase II submissions
Mosaic II imager	PhD
Mosaic z-Band Legacy Survey (MzLS)	Phoenix (high-resolution near-infrared spectrometer)
mosplate	photo-ablation
mountaintop	p.m.
mpc	point spread function
msini	polarimetric
multi (in compound terms, generally do not use hyphen, e.g., multipartner; multislit; multinational, multiwavelength; but multi-object; multi-instrument)	Polysilicon
Mx	postdoc, postdoctoral
Myr	



powerhouse  
pre-ship, pre-shipment  
principal component analysis  
principal investigator (lowercase except when preceding person's name, i.e., Principal Investigator Ken Hinkle, the principal investigator for the project)  
protoplanet  
protoplanetary  
Quality Lighting Teaching Kit (QLT Kit; the kit)  
radial velocity dispersion  
read-time  
readout (noun)  
real time (noun); real-time (adj.)  
RedLaSer  
redshift  
redshifted  
resolution: hyphenate before term in compound adjectives: high-resolution; low-resolution; moderate-resolution; medium-resolution  
ridge (Kitt Peak): west ridge; north ridge  
road map  
roll-off roof observatory (KP)  
SAC  
set up (verb); set-up (adj.); setup (noun)  
shared-risk basis  
shut down (verb); shutdown (noun)  
sidelobe(s)  
sky glow  
sky line  
small-scale (adj.)  
SMARTS consortium  
SOAR 4.1-m telescope  
solar system  
south (direction)  
Southern Hemisphere  
southern sky  
space weather  
space-based (adj.)  
spectropolarimeter  
spring (season)  
staff (plural noun)  
star formation (adj.)  
star-forming (adj.)  
starburst  
subaward  
subfield  
subpixel  
substellar  
summer  
Sun (our Sun; lowercase other suns)  
Sun-like  
supernova (SN)  
supernovae (SNe)  
supersonic  
Survey Program  
Swift  
switchgear  
T Tauri stars  
telescope (lowercase, as in Blanco telescope)  
telnet  
terabytes  
TeraGrid  
test bed  
time-domain (adj.)  
time-sensitive (adj.)  
timescale  
time series observations  
tip-tilt  
Tohono O'odham  
tonne  
toward  
TripleSpec (instrument)  
Type Ia, Type Ia supernova  
U-floor  
ultraviolet  
underrepresented  
United States (noun); US (adj.)  
Universe  
University of Hawai'i  
uppercase  
URL  
US (adj.); United States (noun)  
user guide/user manual  
videoconference  
Washington, DC  
wavefront (adj.)  
waveplate  
weak lensing (adj.)  
weather-tight  
web (CMS 17)  
web page  
web-based (adj.)  
webcam  
webcast  
WebEx  
website



well-known (adj.)	winter (season)
west (direction)	Wireless LAN Controller (WLC)
white paper	WIYN Board meeting
wide-field	WIYN building
wide-field camera	WIYN Consortium
Wi-Fi	workshop
wind shake	X-ray

## States

- Address: Use the postal service two-letter abbreviation in a complete address.  
950 N. Cherry Ave., Tucson, AZ 85719
- City/State format: Spell out (Kitt Peak is near Tucson, Arizona.)
- Institutional Names: Spell out (University of Arizona)

## Telescope Names

- Spell out telescope names at first occurrence. Follow with the abbreviation in parentheses if there will be subsequent abbreviation and use the acronym for all subsequent references.  
Exceptions: MMT, WIYN (use abbreviation in every occurrence)
- Aperture size in telescope names:
  - 4m telescope
  - 4-meter telescope
  - the telescope is 4 meters
  - 8-meter-class telescope
  - 4- to 8-meter-class telescopes
- Names, Personal ftp sites: *ftp://ftp*.
- Web Addresses: Use *http://* only if URL does not include a “www”  
*www.noao.edu*  
*http://legacysurvey.org/dr1/description*
- Use *https://*  
*https://groups.google.com/forum/#!forum/decam-legacy-survey*

## Titles

Books: Italics  
 Journals: Italics  
 Lecture Series: No italics or quotation marks  
 Meetings: No italics or quotation marks for reoccurring meetings (The AAS Meeting); a single meeting title is enclosed in quotation marks (“The Pluto Files”)  
 Newspapers: Italics  
 Photographs: Italics  
 Unpublished Works: Quotation marks  
 Webpages/sections: Quotation marks  
 Websites: No italics or quotation marks

## Word Count

1 page, Calibri, 11 pt = (approx.)  
With two 2.5 × 2.5 images and captions: 300 words, 2000 characters with spaces  
Without image: 550 words; 3400 characters with spaces

## Word Usage

### Acronym/Initialism

Acronym = word formed by the initial letters of a longer name, with the acronym pronounced differently than the full form; do not use “the” and “a/an” before these words

*Examples:* ESO; ALMA

Initialism = word formed by the initial letters of a longer name, with each letter pronounced separately; use “the” and “a/an” as needed before these words

*Examples:* IAU; NSF; NOAO

### Assure/Ensure/Insure

Assure = to promise or say with confidence

I assure you that my calculations are correct.

Ensure = to do what is necessary for success

I documented every observation to ensure I could explain my findings.

Insure = to cover with an insurance policy

I will insure my car as required by law.

### Further/Farther

Farther = distance

Further = in greater detail

We discussed the matter further while walking farther down the road.

### Which/That

- If removing the words introduced by “which” or “that” changes the meaning of the sentence, use “that.” Otherwise, use “which” and precede it with a comma.

*Examples:*

The Mosaic filters include the VR filter, which has an especially broad band-pass.

For the deepest surveys, you should use the Mosaic filter that has the broadest band-pass.

## Abbreviations

2dFGRS	—	2dF Galaxy Redshift Survey
2MASS	—	2-Micron All-Sky Survey
4CES	—	4-Meter Cryogenic Echelle Spectrograph
AAAC	—	Astronomy and Astrophysics Advisory Committee




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AAL	—	Astronomy Australia Limited
AAO	—	Australian Astronomical Observatory
AAS	—	American Astronomical Society
AASC	—	Astronomy and Astrophysics Survey Committee; i.e., the Decadal Survey
AAT	—	Anglo-Australian Telescope
ACHS	—	Asociación Chilena de Seguridad (Chilean Safety Association)
ACCORD	—	AURA Coordinating Council of Observatory Research Directors
ACEAP	—	<b>Astronomy in Chile Educator Ambassadors Program</b>
ACHS	—	Asociacion Chilena de Seguridad (Chilean Safety Association)
ACS	—	Advanced Camera for Surveys
ACTR	—	Advisory Committee on Technical Resources (CTIO)
AD	—	Active Directory
AD		Associate Director (NOAO)
ADA	—	Americans with Disabilities Act
ADC	—	Analog-to-digital converter
ADC	—	Atmospheric dispersion compensator
ADO	—	Associate Director's Office (NOAO)
AE	—	architecture & engineering
AED	—	Automatic External Defibrillator
AER	—	Astronomy Education Review
AFGU	—	Astronomy From the Ground Up
AFRL	—	Air Force Research Laboratory
AFWA	—	Air Force Weather Agency
AGB	—	Asymptotic Giant Branch
AGN	—	active galactic nucleus (or nuclei)
AGU	—	American Geophysical Union
AIP	—	American Institute of Physics
AISES	—	American Indian Science and Engineering Society
AITC	—	assembly, integration, test, and commissioning
AJ	—	<i>Astronomical Journal</i>
ALAN	—	Artificial Light at Night (conference)
ALFALFA	—	Arecibo Legacy Fast ALFA Survey
ALMA	—	Atacama Large Millimeter Array
ALO	—	Andes LIDAR Observatory
ALPACA	—	Advanced Liquid-mirror Probe for Astrophysics, Cosmology and Asteroids
ALTAIR	—	Altitude conjugate adaptive optics for the infrared (Gemini AO system)
ALTAIR	—	Access to Large Telescopes for Astronomical Instruction and Research (NOAO committee)
AMCL	—	AURA Management Committee for LSST
AMNH	—	American Museum of Natural History
ANDICAM	—	A Novel Double-Imaging Camera

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ANTARES	—	Arizona-NOAO Temporal Analysis and Response to Events System
AO	—	<b>adaptive</b> optics
AO	—	Announcement of Opportunity
AODP	—	Adaptive Optics Development Program
AOP	—	Advanced Observing Program (Kitt Peak program)
AOS	—	active optics system (LSST)
AOSS	—	AURA Observatory Support Services
API	—	application programming interface
ApJ	—	<i>Astrophysical Journal</i>
APOGEE	—	Apache Point Galactic Evolution Experiment
APP	—	annual program plan (in 2016 changed to program operations plan [POP])
APS	—	Alignment and Phasing System
ARBSE	—	Astronomy Research Based Science Education
ARC	—	Astronomy Research Consortium
Arcon	—	Array Controller (CCD controller developed at CTIO)
ARCoIRIS	—	<b>Astronomical Research using the Cornell InfraRed Imaging Spectrograph</b>
ARO	—	Arizona Radio Observatory
ARRA	—	American Recovery and Reinvestment Act of 2009
ASAS	—	All Sky Automated Survey
ASCA	—	All-Sky Camera
ASP	—	Advanced Stokes Polarimeter
ASP	—	Astronomical Society of the Pacific
AST	—	Astronomical Sciences (Division of NSF)
ATC	—	Astronomical Technology Center (United Kingdom)
ATI	—	Advanced Technologies & Instrumentation
ATM	—	Atmospheric Sciences (Division of NSF)
ATST	—	Advanced Technology Solar Telescope
ATT	—	Advanced Technology Telescope
AUI	—	Associated Universities, Inc. (runs NRAO)
AURA	—	Association of Universities for Research in Astronomy
AURA-CAS	—	AURA Central Administrative Services
AURA-O	—	AURA Observatory in Chile
AAO	—	Australian Astronomical Observatory
AWIS	—	Association for Women in Science
BAO	—	Baryon acoustic oscillations
BASS	—	Beijing-Arizona Sky Survey
BAT	—	Burst Alert Telescope (one used in NASA's Swift mission)
BBSO	—	Big Bear Solar Observatory
BCG	—	brightest cluster galaxy



BHB	—	Blue horizontal branch (stars)
bHROS	—	bench-mounted High Resolution Optical Spectrograph
BigBOSS	—	Big Baryon Oscillation Spectroscopic Survey (now named MS-DESI)
BPT	—	“Baldwin, Phillips & Terlevich”
BRAVA-RR	—	Bulge Radial Velocity Assay project
BSR	—	Business Service Review
BTC	—	Big Throughput Camera
BTFI	—	Brazilian Tunable Filter Imager
BTO	—	Beam transfer optics
CA	—	Cooperative Agreement
CAA	—	Committee on Astronomy and Astrophysics
CAD	—	computer-aided design
CADIAS	—	Centro de Apoyo a la Didáctica de la Astronomía
CANDELS	—	Cosmic Assembly Near Infra-red Deep Extragalactic Legacy Survey
CARA	—	Center for Astrophysical Research in Antarctica
CARA	—	California Association for Research in Astronomy
CAS	—	Central Administrative Services (AURA department)
CASNet	—	Central Administrative Services Network (NOAO software application)
CATCH	—	Community Access Telescope Clearing House
CATTS	—	Collaboration to Advance Teaching Technology and Science
CBAT	—	Central Bureau for Astronomical Telegrams
CBET	—	Central Bureau Electronic Telegrams
CCD	—	charge-coupled device
CCEL	—	Cooper Center for Environmental Learning
CCNA	—	Cisco Certified Network Associate
CCO	—	Chief Compliance Officer (NOAO)
CD	—	Community Development (NOAO)
CDM	—	cold dark matter
CDR	—	Critical Design Review
CD-ROM	—	Compact Disk – Read Only Memory
CEAZA	—	El Centro de Estudios Avanzados en Zonas Áridas
CELT	—	California Extremely Large Telescope
CEMP	—	Carbon-enhanced metal poor
CfA	—	Harvard Smithsonian Center for Astrophysics
CfAO	—	Center for Adaptive Optics (University of California at Santa Cruz)
CFD	—	computational fluid dynamics
CFIP	—	CTIO Facilities Improvement Project
CFO	—	Central Facilities Operations (NOAO department)
CFOH	—	Central Facilities Operations and Headquarters
CfP	—	Call for Proposals



ChaMPlane	—	Chandra Multi-wavelength Plane Survey
Chandra	—	Chandra X-Ray Observatory (space telescope operated by NASA)
CHARA	—	Center for High Angular Resolution Astronomy
CHIRON	—	CTIO high-resolution spectrometer
CIAA	—	Congreso Internacional de Aficionados a la Astronomía
CIS	—	Computer Infrastructure Services (NOAO)
CISSP	—	Certified Information Systems Security Professional
CIV	—	Corona inception voltage
CL	—	command language
CLEA	—	Contemporary Laboratory Exercises in Astronomy
CMB	—	Cosmic Microwave Background
CMBR	—	Cosmic Microwave Background Radiation
CMD	—	Color magnitude diagram
CME	—	coronal mass ejection
CMOS	—	Complementary Metal Oxide Semiconductor
CNC	—	Computer Numerical Control
CNO	—	carbon-nitrogen-oxygen
COBE	—	Cosmic Background Explorer
CoDR	—	Conceptual Design Review
Co-I	—	co-investigator
COI	—	Conflict of Interest
CP	—	Community Pipeline
CPHS	—	El Comité Paritario de Higiene y Seguridad (Chile)
CSC	—	Community Science Center (SCS)
CONAMA	—	Comisión Nacional de Medio Ambiente
COPUS	—	Coalition on the Public Understanding of Science
CoSEC	—	Collaborative Sun-Earth Connection
COSMOS	—	Cerro Tololo Ohio State Multi-Object Spectrograph
COSMOS	—	Cosmic Evolution Survey
CRAC	—	computer Room Air Conditioner
CSA	—	cooperative support agreement
CSMA	—	Committee on the Status of Minorities in Astronomy
CSDC	—	Community Science and Data Center (NOAO)
CSWA	—	Committee on the Status of Women in Astronomy
CTE	—	charge transfer efficiency
CTIO	—	Cerro Tololo Inter-American Observatory
CWFS	—	Calibration Wave-Front Sensor
CXO	—	Chandra X-ray Observatory
D&D	—	Design and Development



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DASL	—	Data and Activities for Solar Learning
DCAA	—	Defense Contract Audit Agency
DCI	—	Data Cache Initiative
DCR	—	Differential chromatic refraction
DD	—	Director's discretion
DDP	—	Design Development Phase
DDR	—	detailed design review
DECaLS	—	Dark Energy Camera Legacy Survey
DECam	—	Dark Energy Camera
DECaPS	—	Dark Energy Camera Plane Survey
DEEP	—	Deep Extragalactic Evolutionary Probe
DEIMOS	—	Deep Imaging Multi-Object Spectrograph (Keck)
DENIS	—	Deep Near Infrared Survey (of the Southern Sky)
DES	—	Dark Energy Survey
DES Y1	—	Dark Energy Survey Year One data
DES Y2	—	Dark Energy Survey Year Two data
DES	—	Deep Ecliptic Survey
DESDM	—	Dark Energy Survey Data Management
DESI	—	Dark Energy Spectroscopic Instrument
DGAC	—	Dirección General de Aeronautica Civil (Chilean civil aviation administration)
DHS	—	data handling system
DIMM	—	differential image motion monitor
DIQ	—	delivered image quality
DKIST	—	Daniel K. Inouye Solar Telescope
DL	—	Data Lab (NOAO)
DLS	—	Deep Lens Survey
DLSP	—	Diffraction-Limited Spectro-Polarimeter
DM	—	deformable mirror
DMAC	—	Data Management and Analysis Center (GONG)
DMO	—	Data Management Operations
DMU	—	Digital Mock-Up
DMZ	—	demilitarized zone
DNS	—	Domain Name Service
DoD	—	Department of Defense
DOE	—	Department of Energy
DPP	—	Data Products Program (NOAO department)
DQE	—	Detective Quantum Efficiency
DR	—	data release
DRL	—	Division of Research on Learning in Formal and Informal Settings
DRM	—	Design Reference Mission
DSD	—	Dark Sky Discovery Program (NOAO)



DSDS	—	Data Storage and Distribution System
DST	—	Dunn Solar Telescope
DTS	—	data transfer system
DWDM	—	dense wavelength-division multiplexing
E2E	—	End-to-End
e2v	—	e2v Technologies (vendor producing new detectors)
EC	—	Executive Council (changed from Executive Committee)
ECAD	—	Electronic computer-aided design
ESACHS	—	Empresa de Servicios de ACHS (subsidiary service company of the Chilean Safety Association)
EGSO	—	European Grid of Solar Observations
EIS	—	Environmental Impact Statement
ELT	—	extremely large telescope
EMSS	—	Einstein Medium Sensitivity Survey
EO		end of
EO	—	Educational Outreach
EPDS	—	Extreme Precision Doppler Spectrograph (now NEID)
EPA	—	Environmental Protection Agency
EPO	—	Education and Public Outreach (NOAO department, formerly PAEO)
EPOXI	—	Extrasolar Planet Observation and Deep Impact Extended Investigation
EPO-N	—	Education & Public Outreach North (NOAO)
EPO-S	—	Education & Public Outreach South (NOAO)
ESA	—	European Space Agency
ESD	—	electrostatic discharge
ESF	—	Evans Solar Facility
ESO	—	European Southern Observatory
ESSENCE	—	Equation of State: SupErNovae trace Cosmic Expansion
ET	—	Exoplanet Tracker
ETC	—	Explosive Transient Camera
ETS	—	Engineering and Technical Services (NOAO)
EVLA	—	Expanded Very Large Array
F&A	—	Facilities and Administrative
FDDI	—	Fiber Distributed Data Interface
FDP	—	full-disk patrol
FEA	—	Finite Element Analysis
FEPS	—	Formation and Evolution of Planetary Systems
FFRDC	—	Federally Funded Research and Development Center
FHiRE	—	Fiber High Resolution Echelle




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FIDEL	—	Far-Infrared Deep Extragalactic Legacy (a survey)
FDR	—	Final Design Review
FIRS	—	Facility Infrared Spectropolarimeter
FITS	—	Flexible Image Transport System
FLAMINGOS	—	Florida Multi-Object Imaging Near-Infrared Grism Observational Spectrometer
FLAMINGOS-2	—	(Second FLAMINGOS instrument for Gemini)
FO	—	Facilities Operations (NOAO-S)
FORCAST	—	Faint Object Infrared Camera for the SOFIA Telescope
FOV	—	field of view
FPGA	—	Field programmable gate array
FSM	—	Fast Steering Secondary Mirror
FSR	—	Free spectral range
FTE	—	full-time equivalent
FTS	—	Fourier Transform Spectrometer
FUSE	—	Filesystem in Userspace (software interface)
FWHM	—	full width half-maximum
FY	—	fiscal year
G&A	—	General & Administrative
GALEX	—	Galaxy Evolution Explorer
GAMA	—	Galaxy And Mass Assembly
GB	—	gigabytes
Gbps	—	Gigabits per second
GDDS	—	Gemini Deep Deep Survey
GeMS	—	Gemini Multi-Conjugate Adaptive Optics System (Gemini Mcao System)
GEMS	—	Great Explorations in Math and Science
GHOS	—	Gemini High-Resolution Optical Spectrograph
GHOU	—	Global Hands-On Universe
GIS	—	Geographical Information System
GLAO	—	Ground Layer Adaptive Optics
GLAST	—	Gamma-ray Large Area Space Telescope
GLOBE	—	Global Learning and Observations to Benefit the Environment (GLOBE at Night program)
GMOS	—	Gemini Multi-Object Spectrograph
GMT	—	Giant Magellan Telescope
GNIRS	—	Gemini Near Infrared Spectrograph
GO	—	Guest Observer program
GO-FAAR	—	Graduate Opportunities at Fisk in Astronomy and Astrophysics Research
GOES	—	Gemini Optical Echelle Spectrometer
GOES	—	Geostationary Operational Environmental Satellite

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GOLF	—	Global Oscillations at Low Frequencies
GONG	—	Global Oscillation Network Group
GOODS	—	Great Observatories Origins Deep Survey
GPI	—	Gemini Planet Imager
GPFS	—	General Parallel File System
GPRA	—	Government Performance and Results Act of 1993
GRB	—	Gamma-ray Burst
GSA	—	General Services Administration (US government)
GSAOI	—	Gemini South Adaptive Optics Imager
GSC	—	Gemini Science Committee
GSFC	—	Goddard Space Flight Center (NASA)
GSM	—	Generalized Seeing Monitor
GSMT	—	Giant Segmented Mirror Telescope
GSMTPO	—	Giant Segmented Mirror Telescope Program Office (NOAO department)
GTC	—	Gran Telescopio Canarias
GWFMOS	—	Gemini Wide Focus Multi-Object Spectrograph
HAO	—	High Altitude Observatory
HATNet	—	Hungarian Automated Telescope Network
HBCU	—	Historically Black Colleges and Universities
HDF	—	Hubble Deep Field
HDI	—	Half-Degree Imager
HDRI	—	high dynamic range imaging
HEASARC	—	High Energy Astrophysics Science Archive Research Center (NASA)
HET	—	Hobby-Eberly Telescope
HIPASS	—	HI Parkes All Sky Survey
HIRES	—	High Resolution Echelle Spectrometer
HMI	—	Helioseismic and Magnetic Imager
HOO	—	Hands-On Optics (NOAO)
HQ	—	headquarters
HR	—	Human Resources
HRMS	—	Human Resource Management System
HST	—	Hubble Space Telescope
HVAC	—	Heating, Ventilating, Air Conditioning
HZSST	—	High z Supernova Search Team
IAC	—	Instituto de Astrofísica de Canarias (Spain)
IAS	—	Instrument Adapter System (WIYN)
IAU	—	International Association of Universities
IAU	—	International Astronomical Union




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IBIS	—	Infrared Boötes Imaging Survey
IBIS	—	Interferometric Bidimensional Spectrometer (Arcetri Observatory)
ICD	—	Interface Control Document
ICE	—	IRAF Control Environment
ICM	—	intracluster medium
IDA	—	International Dark-Skies Association
IDL	—	Interactive Data Language
IfA	—	Institute for Astronomy (University of Hawai`i)
IFTS	—	imaging Fourier transform spectrograph
IFU	—	integral field unit
IGM	—	intergalactic medium
IGO	—	International Gemini Observatory (twin telescopes in Hawai`i and Chile)
IGP	—	International Gemini Project
IHF	—	Instrument Handling Facility
IHY	—	International Heliophysical Year
IINSPIRE	—	Iowa, Illinois, Nebraska STEM Partnership for Innovation in Research
IMACS	—	Inamori-Magellan Areal Camera and Spectrograph
IMF	—	initial mass function
INAOE	—	Instituto Nacional de Astrofísica, Óptica y Electrónica
INTEGRAL	—	International Gamma-Ray Astrophysics Laboratory
IPAC	—	Infrared Processing and Analysis Center
IR	—	Infrared
IRAC	—	Infrared Array Camera (Spitzer instrument)
IRAF	—	Image Reduction and Analysis Facility
IRAS	—	Infrared Astronomical Satellite
IRMOS	—	Infrared Multi-Object Spectrograph
iRODS	—	Integrated Rule-Oriented Data System
IRS	—	Infrared Spectrograph (Spitzer)
IRTF	—	Infrared Telescope Facility (NASA)
ISE	—	Informal Science Education
iSHELL	—	(new instrument planned for NASA's Infrared Telescope Facility)
ISM	—	interstellar medium
ISOON	—	Improved Solar Observing Optical Network (called OSPAN as of 2006)
ISPI	—	Infrared Side Port Imager (NOAO)
ISS	—	Integrated Sunlight Spectrometer
iSTB	—	Internet Save the Bits
IT&C	—	Integration, Testing, & Commissioning
ITAC	—	International Telescope Allocation Committee
ITAR	—	International Traffic in Arms Regulations
ITC	—	Integration Time Calculator (Gemini instrument tool)
IUE	—	International Ultraviolet Explorer

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IVOA	—	International Virtual Observatory Alliance
IYA	—	International Year of Astronomy
JHA	—	Job Hazard Analysis
JHU	—	The Johns Hopkins University
JINA	—	Joint Institute for Nuclear Astrophysics
JPL	—	Jet Propulsion Laboratory
JSPS	—	Japan Society for the Promotion of Science
JUF	—	joint use fee
JWST	—	James Webb Space Telescope
KAOS	—	Kilo-Aperture Optical Spectrograph
KASI	—	Korea Astronomy and Space Science Institute
KBOs	—	Kuiper Belt objects
KCWI	—	Keck Cosmic Web Imager
keV	—	kiloelectron Volt
KINGFISH	—	Key Insights on Nearby Galaxies: a Far Infrared Survey with Herschel
KMF	—	K-band luminosity function
KMTNet	—	Korea Microlensing Telescope Network
KOSMOS	—	Kitt Peak Ohio State Multi-Object Spectrograph
KP	—	Kitt Peak
KPMO	—	Kitt Peak Mountain Operations
KPNO	—	Kitt Peak National Observatory
KPST	—	Kitt Peak SOLIS Tower
KPVC	—	Kitt Peak Visitor Center
KPVT	—	Kitt Peak Vacuum Telescope (retired October 2003)
LACP	—	Link Aggregation Control Protocol
LALA	—	Large Area Lyman Alpha survey
LAMOST	—	Large Aperture Multi-Object Spectroscopic Telescope
LAPLACE	—	Life and Planets Astrobiology Center (University of Arizona)
LS	—	La Serena
LBG	—	Lyman break galaxy
LBNL	—	Lawrence Berkeley National Laboratory
LBT	—	Large Binocular Telescope
LCDM	—	Lambda-Cold Dark Matter (or $\Lambda$ -CDM)
LCO	—	Las Campanas Observatory
LCO	—	Las Cumbres Observatory
LCOGT	—	Las Cumbres Observatory Global Telescope
LCOGTN	—	Las Cumbres Observatory Global Telescope Network



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LCRS	—	Las Campanas Redshift Survey
LCSC	—	LSST Community Science Center
LGS	—	laser guide star
LIRG	—	luminous infrared galaxy
LLNL	—	Lawrence Livermore National Laboratory
LLT	—	laser launch telescopes
LMC	—	Large Magellanic Cloud
LMCM	—	Laser Mask Cutting Machine
LMCT	—	Lockheed Martin Coherent Technologies
LMT	—	Large Millimeter Telescope
LNA	—	Laboratório Nacional de Astrofísica (Brazil)
LPL	—	Lunar and Planetary Laboratory (University of Arizona)
LLP TAC	—	Large and Long Program Time Allocation Committee (Gemini)
LRP	—	Long Range Plan
LSES	—	Long Slit Echelle Spectrograph
LSP	—	Large Science Program
LSSDS	—	La Serena School for Data Science
LSST	—	Large Synoptic Survey Telescope
LSSTC	—	LSST Corporation
LTE	—	Local Thermodynamic Equilibrium
LVTD	—	linear variable differential transformer
LWS	—	Living With a Star
M2	—	secondary mirror
MACHO	—	massive compact halo object
MAP	—	Microwave Anisotropy Probe
MARS	—	Multi-Aperture Red Spectrometer
MARS	—	Metadata Archive Retrieval System
MASS	—	multi-aperture scintillation sensor
Mbps	—	Megabits per second
MCAO	—	multi-conjugate adaptive optics
MCC	—	Maui Community College
MCELS	—	Magellanic Clouds Emission Line Survey
MCI	—	Michelson Doppler Imager
McMP	—	McMath-Pierce Solar Telescope
MDI	—	Michelson Doppler Imager
MEDB	—	Maui Economic Development Board
MDM	—	MDM Observatory (not an abbreviation)
MEIFU	—	million element integral field unit
MEMS	—	Micro Electrical Mechanical Systems
MESA	—	Math, Engineering, and Science Achievement

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MHD	—	Magnetohydrodynamic
MIHDAS	—	mid-IR high dispersion AO-fed spectrograph
MIKE	—	Magellan Inamori Kyocera Echelle
MIP	—	Major Instrumentation Program (NOAO department, now called SI)
MIRES	—	Mid-IR Echelle Spectrograph
MK	—	Mauna Kea
MKIR	—	Mauna Kea Infrared
MMIRS	—	MMT and Magellan Infrared Spectrograph
MMT	—	Multiple Mirror Telescope (This meaning is not used anymore; the name is the initialism only.)
MOCASSIN	—	Monte Carlo Simulations of Ionized Nebulae
MODS1	—	Multi-Object Double Spectrograph (copy 1 for LBT))
MODS2	—	Multi-Object Double Spectrograph (copy 2 by Ohio State)
MOMFOS	—	multi-object multi-fiber optical spectrograph
MONSOON	—	(Not an acronym.) A scalable, multi-channel high-speed array controller and image acquisition system
MOS	—	multiple object spectroscopy
Mosaic	—	Not an acronym. It is the NOAO CCD wide-field imager having 8192 x 8192 pixels (also called CCD Mosaic Imager)
MOSFIRE	—	Multi-Object Spectrograph for Infrared Exploration
MOU	—	Memorandum of Understanding
MPS	—	Mathematical and Physical Sciences (NSF Directorate)
MREFC	—	Major Research Equipment and Facility Construction (NSF)
MRF	—	magneto-rheological finishing
MRI	—	Major Research Instrumentation (NSF)
MRO	—	Magdalena Ridge Observatory
MRS	—	Medium-Resolution Spectrograph
MS	—	Main sequence (stars)
MS-DESI	—	Mid-Scale Dark Energy Spectroscopic Instrument (formerly known as BigBOSS)
MSIP	—	Mid-Scale Innovations Program
MTDC	—	modified total direct costs
NAAAC	—	National Astronomy and Astrophysics Advisory Committee
NAC	—	NSO Array Camera (formerly NSO Aladdin Array Camera)
NAHB	—	Native American, Hispanic, and Black Undergraduates
NAI	—	NASA Astrobiology Institute
NAOC	—	National Astronomical Observatories of the Chinese Academy of Sciences
NAOJ	—	National Astronomical Observatory of Japan
NARTC	—	Native American Research and Training Center
NAS	—	National Academy of Sciences




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NASA	—	National Aeronautics and Space Administration
NC	—	NOAO Core
NCAR	—	National Center for Atmospheric Research
NCE	—	no-cost extension
NCEP	—	National Centers for Environmental Prediction
NCOA	—	National Center for Optical-Infrared Astronomy
NCSA	—	National Center for Supercomputing Applications
NDO	—	National Optical Astronomy Observatory's Director's Office
NDSC	—	Network for the Detection of Stratospheric Change
NDWFS	—	NOAO Deep Wide-Field Survey
NEID	—	NN-EXPLORE Exoplanet Investigations with Doppler Spectroscopy
NEO	—	Near-Earth Object
NEOWISE	—	Asteroid-hunting component of NASA's Wide-field Infrared Survey Explorer (WISE)
NESSI	—	NASA Exoplanet Star (and) Speckle Imager
NESTA	—	National Earth Science Teachers Association
NEWFIRM	—	NOAO Extremely Wide-Field Infrared Mosaic imager
NFIRAOS	—	Narrow Field Infra-Red Adaptive Optics System (for TMT)
NFPS	—	NOAO Fundamental Plane Survey
NGAO	—	Next-Generation Adaptive Optics (Keck)
NGC	—	New General Catalog
NGCP	—	National Girls Collaborative Project
NGO	—	National Gemini Office
NGOS	—	Next Generation Optical Spectrograph (on Mayall 4-meter)
NGP	—	North Galactic Pole
NGS	—	natural guide star
NGSC	—	NOAO Gemini Science Center
NGSL	—	Next Generation Spectral Library
NGST	—	Next Generation Space Telescope
NHPA	—	National Historic Preservation Act
NHPPS	—	NOAO High-Performance Pipeline System
NICI	—	Near-Infrared Coronagraphic Imager (NASA project for Gemini South)
NICMOS	—	Near Infrared Camera and Multi-Object Spectrometer
NIF	—	National Ignition Facility
NIFS	—	Near-Infrared Integral Field Spectrograph (Gemini)
NIO	—	New Initiatives Office (former name of GSMTPO)
NIRDIF	—	near-infrared deployable integral field spectrograph
NIRIS	—	near infra-red echelle spectrograph
NIRI	—	Near-Infrared Imager (on Gemini North)
NIRSP	—	Near-IR Spectro-Polarimeter
NIRSPEC	—	Near-Infrared Echelle Spectrograph (on Keck II)

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NISP	—	NSO Integrated Synoptic Program (combination of GONG & SOLIS)
NITARP	—	NASA/IPAC Teacher Archive Research Program
NJIT	—	New Jersey Institute of Technology
NLFF	—	Non-Linear Force-Free
NLTE	—	Non-Local Thermodynamic Equilibrium
NMBS	—	NEWFIRM Medium Band Survey
NN	—	NOAO North
NN-ETS	—	NOAO North Engineering and Technical Services
NN-EXPLORE	—	NASA-NSF Exoplanet Observational Research program
NOAA	—	National Oceanic and Atmospheric Administration
NOAO	—	National Optical Astronomy Observatory
NOAO-N	—	National Optical Astronomy Observatory-North
NOAO-S	—	National Optical Astronomy Observatory-South
NOP	—	Nightly Observing Program (NOAO)
NPOI	—	Navy Prototype Optical Interferometer
NRAO	—	National Radio Astronomy Observatory
NRC	—	National Research Council
NRL	—	Naval Research Laboratory (United States)
NS	—	NOAO South
NSA	—	NOAO Science Archive (former name of Science Data Archive at NOAO; changed in 2017)
NSC	—	NOAO Source Catalog
NSF	—	National Science Foundation
NSF/AST	—	National Science Foundation, Division of Astronomical Sciences
NSF/ATM	—	National Science Foundation, Division of Atmospheric Sciences
NSO	—	National Solar Observatory
NSO/SP	—	National Solar Observatory Sacramento Peak
NSO/T	—	National Solar Observatory Tucson
NSTA	—	National Science Teachers Association
NVO	—	National Virtual Observatory
OIR	—	optical infrared
OA	—	Observing Assistant
OAD	—	Observatory Architecture Document
OC	—	Observatory Council
OCD	—	Operations Concept Document
OCIW	—	Observatories of the Carnegie Institution of Washington
OCS	—	Observation Control System
ODI	—	One Degree Imager
OGCE	—	Open Grid Computing Environment




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OIWFS	—	on-instrument wavefront sensor
OMB	—	Office of Management and Budget
OPCC	—	Oficina de Protección de la Calidad del Cielo del Norte de Chile
OPD	—	optical path difference
OpSim	—	Operations Simulator (LSST)
OPTIC	—	Orthogonal Parallel Transfer Imaging Camera
OpsWG		Operations Working Group (Gemini)
ORD	—	Observatory Requirements Document
OSA	—	Optical Society of America
OSCIR	—	mid IR camera and spectrometer system built at University of Florida
OSIRIS	—	Ohio State Infra-Red Imager and Spectrometer
OSIRIS	—	OH-Suppressing Infra-Red Imaging Spectrograph (built by UCLA for Keck with TSIP funds)
OSIRIS	—	Optical System for Imaging and Low-Resolution Integrated Spectroscopy (instrument on Gran Telescopio CANARIAS, Canary Islands)
OSMOS	—	Ohio State Multi-Object Spectrograph
OSPAN	—	Optical Solar Patrol Network (formerly ISOON)
OSTP	—	Office of Science and Technology Policy
OT	—	Observing Tool (Gemini)
OTA	—	Orthogonal Transfer Array
OTOP	—	Overnight Telescope Observing Program (NOAO)
OWL	—	overwhelmingly large telescope
P&T	—	promotion and tenure
PA	—	position angle
PAARE	—	Partnerships in Astronomy & Astrophysics Research and Education
PAEO	—	Public Affairs and Educational Outreach (NOAO department, now EPO)
PAH	—	polycyclic aromatic hydrocarbons
Pan-STARRS	—	Panoramic Survey Telescope & Rapid Response System
PASRD	—	Pipeline Software and Archive Science Requirements Document
PCA	—	Principal Component Analysis
PDO	—	NOAO Planning and Development Office
PDR	—	Preliminary Design Review
PEMP		Performance Evaluation and Measurement Plan
PEP	—	Program Execution Plan
PHA	—	Potentially hazardous asteroid (orbits come within 50,000 km of the Earth)
PI	—	principal investigator (no periods)
PIA	—	Prácticas de Investigación en Astronomía
PICASSO	—	Portable Ionospheric Camera and Small-Scale Observatory
PIO	—	Public Information and Outreach
PipeQA	—	Pipeline Quality Assessment (software package)

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PIT	—	Phase I Tool (Gemini)
PMAC	—	Permanent Magnet alternating current (motor control type)
PMS	—	pre-main sequence
PN	—	planetary nebula
PNe	—	planetary nebulae
pODI	—	partially populated (focal plane) ODI
POP	—	program operations plan
POPPR	—	program operations plan progress report
PPA	—	Pipeline, Portal, and Archive (an ODI project)
PPE	—	personal protective equipment
PREST	—	Program for Research and Education with Small Telescopes
PRIMO	—	Prime Focus Infrared Mosaic wide-field camera
PRIMUS	—	Prism Multi-object Survey
PROMPT	—	Panchromatic Robotic Optical Monitoring and Polarimetry Telescopes
ProtoDESI	—	Prototype instrument for the Dark Energy Spectroscopic Instrument
PRP	—	program review panel
PRVS	—	Precision radial velocity spectrometer
PSD	—	power spectral density
PSF	—	point spread function
PSI	—	Planetary Science Institute
PSPT	—	Precision Solar Photometric Telescope
PTI	—	Pervasive Technology Institute (Indiana University)
PWV	—	precipitable water vapor
QE	—	Quantum efficiency
QLT	—	Quality Lighting Teaching (kit program at NOAO)
QRP	—	Quick-reduce pipeline
QSO	—	quasi-stellar object
QUIRC	—	Quick IR Camera (Gemini North)
QUOTA	—	Quad Orthogonal Transfer Array camera
RA/Dec	—	Right Ascension/Declination
RADIUS	—	Remote Authentication Dial In User Service
RAID	—	Redundant Array of Independent Disks
RASICAM	—	Radiometric All Sky Infrared Camera
RASL	—	Research in Active Solar Longitudes
RBSE	—	Research Based Science Education
RCR	—	Responsible Conduct in Research
RCS2	—	Red Sequence Cluster Survey 2
RCT	—	Robotically Controlled Telescope




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RedLaSer	—	Red de Estudiantes de La Serena
Region IV	—	IV Región de Coquimbo
RESOLVE	—	REsolved Spectroscopy Of a Local VolumE
ReSTAR	—	Renewing Small Telescopes for Astronomical Research
RET	—	Research Experiences for Teachers
REU	—	Research Experiences for Undergraduates
REUNA	—	Red Universitaria Nacional (National University Network; Chile)
RFI	—	Request for Information
RFQ	—	request for quote
RGB	—	Red Giant Branch
RISE/PSPT	—	Radiative Inputs from Sun to Earth/Precision Solar Photometric Telescope
RMS	—	root mean square
ROB	—	round office building (use “administration building”) on Cerro Tololo
RoHS	—	Restriction of Hazardous Substances
ROI	—	region of interest
ROSA	—	Rapid Oscillations in the Solar Atmosphere
ROTSE	—	Robotic Optical Transient Search Experiment
RSS	—	root sum squares
RTI	—	Real-Time Innovations, Inc.
RV	—	radial velocity
SAC	—	Science Advisory Committee
SACNAS	—	Society for the Advancement of Chicanos and Native Americans in Science
SALT	—	Southern African Large Telescope
SAM	—	SOAR Adaptive-optics Module
SAMI	—	SOAR Adaptive Module Imager
SAMP	—	Simple Application Messaging Protocol
SAO	—	Smithsonian Astrophysical Observatory
SARA	—	Southeastern Association for Research in Astronomy
SARM	—	Romanian Society for Meteors and Astronomy
SBC	—	Solar Blind Channel
SBIG	—	Santa Barbara Instrument Group
SCB	—	Sequential Chromospheric Brightening
SCIDAR	—	Scintillation Detection and Ranging
SCOPE	—	Southwestern Consortium of Observatories for Public Education
SDAC	—	Solar Data Analysis Center
SDO	—	NOAO System Development Office (former department)
SDO	—	Solar Dynamics Observatory
SDQA	—	Science Data Quality Analysis (LSST)
SDSS	—	Sloan Digital Sky Survey
SED	—	spectral energy distribution

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SEGUE	—	Sloan Extension for Galactic Understanding and Exploration
SFC	—	Space Flight Center (NASA)
SFM	—	sum-frequency mixing
SFR	—	star formation rate
SI	—	System Instrumentation (NOAO department, formerly MIP)
SIAP	—	Single Image Access Protocol (VAO)
SIFS	—	SOAR Integral Field Unit Spectrograph
SIG	—	Special Interest Group
SIMON	—	Spectromètre Infrarouge de Montréal (IR spectrometer for SMARTS 1.5-m telescope)
SINGG	—	Survey for Ionization in Neutral Gas Galaxies
SIRFT	—	Space Infrared Telescope Facility
SISPI	—	Survey Image System Process Integration (for DECam)
SKA	—	Square Kilometer Array
SLAC	—	No longer an acronym
SMARTS	—	Small and Moderate Aperture Research Telescope System
SMASH	—	Survey of the MAgellanic Stellar History
SMG	—	submillimeter galaxy
SMT	—	Submillimeter Telescope
SMT	—	surface mount technologies
SN	—	supernova
SNe	—	supernovae
SNIa	—	supernovae Type Ia
SOAR	—	Southern Astrophysical Research (a 4.1-m telescope)
SOAR TCS	—	SOAR Telescope Control System (TCS)
SOC	—	Solar Observatory Council (AURA)
SODAR	—	Sonic Detection and Ranging
SOFIA	—	Stratospheric Observatory for Infrared Astronomy
SOHO	—	Solar and Heliospheric Observatory
SOI	—	SOAR Optical Imager
SOI	—	Silicon-On-Insulator
SOI	—	Solar Oscillations Investigations (SOHO)
SOLIS	—	Synoptic Optical Long-term Investigations of the Sun
SOML	—	Steward Observatory Mirror Lab
SONG	—	Stellar Oscillation Network Group
SOT	—	Solar Optical Telescope
SPCA	—	spectral principal component analysis
SPD	—	Solar Physics Division (AAS)
SPIE	—	SPIE, the international society for optical engineering
SPIFFI	—	spectrometer for infrared fiber-fed field imaging
SPINOR	—	Spectro-Polarimeter for Infrared and Optical Regions




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SPO	—	Special Projects Office (NOAO department)
SPO	—	Scientific Program Order (NSF)
SPRF	—	Science Personal Research Funds
SQIID	—	Simultaneous Quad Infrared Imaging Device
SQL	—	Structured Query Language
SR	—	Senior Review
SRA	—	Summer Research Assistant
SRB	—	Storage Resource Broker
SRD	—	Science Requirements Document
SRS	—	Science Research Support
SSC	—	Science Steering Committee (WIYN)
SSC	—	Spitzer Science Center
SSC	—	super star clusters
SST	—	Swedish Solar Telescope
SSTAR	—	Simulated Survey Tools for Analysis and Reporting
SSWG	—	Site Survey Working Group (ATST)
STAC	—	Science and Technology Advisory Committee (Gemini)
STB	—	Save The Bits
STEAM	—	STEM Talent Expansion via Applied Mathematics
STELES	—	SOAR Telescope Echelle Spectrograph
STEM	—	science, technology, engineering, and mathematics
STEP	—	Summer Teacher Enrichment Program
STEREO	—	Solar Terrestrial Relations Observatory
STFC	—	Science and Technology Facilities Council
STIS	—	Space Telescope Imaging Spectrograph (on HST)
STScI	—	Space Telescope Science Institute
SuperMACHO	—	five-year microlensing survey of the Large Magellanic Cloud
SV	—	system verification
SWG	—	Science Working Group
SWIRE	—	Spitzer Wide-Area Infrared Extragalactic Survey
SXT	—	soft X-ray telescope
SZ	—	Sunyaev-Zel'dovich
TAC	—	Telescope Allocation Committee
TADA	—	Telescope Automatic Data Archiving
TAP	—	Table Access Protocol
TASCA	—	Tololo All Sky Camera
TB	—	Terabytes
TBSR	—	Total Business Service Review
TCS	—	Telescope Control System (SOAR)

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TDS	—	Time Domain Services (NOAO)
TelOps	—	Telescope Operations (NOAO)
TERO	—	Tribal Employment Rights Office (Tohono O’odham Nation)
TIM	—	Mexican Infrared-Optical Telescope
TIO	—	Thirty Meter Telescope International Observatory
TLRBSE	—	Teacher Leaders in Research-Based Science Education
TMT	—	Thirty Meter Telescope
TOCC	—	Tohono O’odham Community College
TON	—	Tohono O’odham Nation
ToO		Target of Opportunity
TORRENT	—	(Not an acronym.) Next generation of MONSOON controller
TOTOL		Tohono O’odham Truck of Love (Summer Camp)
TOUA	—	Tohono O’odham Utility Authority
TP	—	thermally pulsing
TPF	—	Terrestrial Planet Finder
TRACE	—	Transition Region and Coronal Explorer
T-ReCS	—	Thermal-Region Camera Spectrograph
TRGB	—	tip of the red giant branch
TS4	—	TripleSpec4 (now called the ARCoIRIS)
TSIP	—	Telescope System Instrumentation Program
UA	—	University of Arizona
UBF	—	Universal Birefringent Filter
UCL	—	<a href="#">University College London</a>
UCLES	—	University College London Echelle Spectrograph
UH	—	University of Hawai’i
UITS	—	University Information Technology Services (Indiana University)
UITS	—	University IT Services (U. of Arizona)
UK	—	United Kingdom
UK/ATC	—	United Kingdom Astronomical Technology Center
UKIRT	—	United Kingdom Infra-Red Telescope
ULIRG	—	ultra-luminous infrared galaxy
UNAM	—	Universidad Nacional Autónoma de México
UNESCO	—	United Nations Educational, Scientific and Cultural Organization
UNL	—	Unified Modeling Language
UPS	—	uninterruptible power supply
URAT	—	USNO Robotic Astrometric Telescope
URM	—	underrepresented minority
URO	—	University Radio Observatories
US	—	United States of America



USAF	—	United States Air Force
USL	—	US Land – Public Sector Solution Software
US NGO	—	US National Gemini Office
USNO	—	United States Naval Observatory
UV	—	ultraviolet
UVOT	—	UltraViolet/Optical Telescope (one used in NASA’s Swift mission)
UW	—	University of Washington
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VAO	—	Virtual Astronomical Observatory
VC	—	Visitor Center (NOAO)
VCCS	—	Virtual Camera Control System (Dunn Solar Telescope)
VERITAS	—	Very Energetic Radiation Imaging Telescope Array System
VIMOS	—	Visible Multiobject Spectrogram
VIRUS-P	—	Visible Integral-field Replicable Unit Spectrograph - Prototype (at McDonald Observatory)
VISTA	—	Visible and Infrared Survey Telescope for Astronomy
VLAN	—	virtual local area network
VLBA	—	Very Long Baseline Array (NRAO)
VLT	—	Very Large Telescope
VO	—	Virtual Observatory
VoIP		<b>Voice over Internet Protocol</b>
VPH	—	Volume-Phase Holographic (grating technology developed in part by NOAO)
VPN	—	Virtual private network
VRI	—	V-, R, and I- bands
VSM	—	Vector Spectromagnetograph
VSO	—	Virtual Solar Observatory
VTF	—	Visible Tunable Filter
WBS	—	Work Breakdown Structure
WCS	—	world coordinate solution
WDC	—	Workforce and Diversity Committee (AURA)
WEBUD	—	Web-based Budget (NOAO software application)
WEPOC	—	Workforce, Education, Public Outreach, and Communication
WFC3	—	Wide Field Camera 3 (HST instrument)
WFIRST	—	Wide-Field Infrared Survey Telescope
WFMO	—	Wide Field Fiber Multi-Object Spectrograph
WFPC2	—	Wide Field Planetary Camera 2 (HST instrument)
WFS	—	Wide-Field Survey (in science-oriented material)
WFS	—	wavefront sensor
WGSG	—	wave front sensing guider
WHAM	—	Wisconsin H-Alpha Mapper



WHIRC	—	WIYN High-Resolution Infrared Camera
WISE	—	Wide-field Infrared Survey Explorer
WIYN	—	Consortium consisting of the University of Wisconsin, Indiana University, NOAO, and the University of Missouri (previously Yale University was a member)
WMAP	—	Wilkinson Microwave Anisotropy Probe
WOCS	—	WIYN Open Cluster Study
WR	—	Wolf-Rayet (stars)
WTS	—	Web Time Sheets
WTTM	—	WIYN Tip-Tilt Module
WWT	—	WorldWide Telescope
WWW	—	World Wide Web
XSEDE	—	Extreme Science and Engineering Discovery Environment
XSL	—	<i>X-Shooter Spectral Library</i>
XRT	—	X-Ray Telescope (used in NASA's Swift mission)
YGO	—	Youth Group Program (NOAO)
YSO	—	young stellar object
ZIMPOL	—	Zürich Imaging Polarimeter
ZTF	—	Zwicky Transient Facility