

# Graphical Abstract

## A Sample Article for Elsevier CAS Template

Alan Lujan, Christopher Carroll



*Sample Figure*

## Highlights

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- MyST Markdown enables reproducible scientific writing
- Seamless export to multiple journal formats
- Support for both single and double column layouts

We know what we are, but know not what we may be.

**Figure 1:** \*

William Shakespeare, Hamlet

# A Sample Article for Elsevier CAS Template

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## ARTICLE INFO

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## ABSTRACT

This is a sample article demonstrating the use of MyST Markdown with Elsevier's CAS templates. The template supports both single-column and double-column layouts, making it suitable for various Elsevier journals. We demonstrate the key features including author metadata, affiliations, keywords, and structured content.

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## 1. Introduction

This document demonstrates the integration of MyST Markdown (Cockett, Purvis and others, 2023) with Elsevier's CAS templates. MyST provides a powerful authoring experience while maintaining compatibility with traditional LaTeX journal requirements (Lamport, 2004).

### 1.1. Background

Scientific publishing has traditionally relied on LaTeX for high-quality typesetting (Smith and Doe, 2020). However, the learning curve and complexity of LaTeX can be a barrier for many researchers. MyST Markdown bridges this gap by providing:

1. A familiar Markdown syntax based on CommonMark (Gruber, 2004)
2. Rich scientific features (equations, citations, cross-references)
3. Export to multiple formats including PDF via LaTeX

Reproducible research workflows have become increasingly important, with tools like Jupyter Notebooks (Kluyver, Ragan-Kelley and others, 2016) enabling literate programming approaches.

## 2. Typography Features

This section demonstrates MyST Markdown typography features and how they render in the PDF output.

### 2.1. Inline Formatting

Standard inline formatting includes **bold text**, *italic text*, and `inline code`. You can also use ~~strikethrough text~~ and underlined text for special emphasis.

For chemical formulas, use subscripts: H<sub>2</sub>O, CO<sub>2</sub>. For ordinals, use superscripts: the 4<sup>th</sup> of July, 1<sup>st</sup> place.

### 2.2. Quotations

Block quotes are useful for highlighting important passages:

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## 2.3. Definition Lists

MyST supports definition lists for glossaries or term explanations:

**MyST** Markedly Structured Text, a markdown flavor for scientific writing

**LaTeX** A document preparation system for high-quality typesetting

**jtex** A Jinja-based templating system for LaTeX documents

## 2.4. Footnotes

MyST supports footnotes<sup>1</sup> which are automatically numbered and placed at the end of the document. You can have multiple footnotes<sup>2</sup> throughout your text.

## 2.5. Task Lists

Task lists can track progress (rendered as bullet points in LaTeX):

- Create template structure
- Add typography examples
- Submit to journal

## 3. Proofs and Theorems

MyST supports formal mathematical environments using proof directives. These are essential for mathematical and theoretical papers.

### 3.1. Definitions and Theorems

**Definition 3.1** (Convergent Sequence). *A sequence  $(a_n)$  in  $\mathbb{R}$  is said to be convergent if there exists a number  $L \in \mathbb{R}$  such that for every  $\varepsilon > 0$ , there exists  $N \in \mathbb{N}$  such that for all  $n > N$ :*

$$|a_n - L| < \varepsilon \tag{1}$$

We write  $\lim_{n \rightarrow \infty} a_n = L$ .

**Theorem 3.1** (Squeeze Theorem). *Let  $(a_n)$ ,  $(b_n)$ , and  $(c_n)$  be sequences such that  $a_n \leq b_n \leq c_n$  for all  $n \geq N_0$ . If*

$$\lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} c_n = L \tag{2}$$

*then  $\lim_{n \rightarrow \infty} b_n = L$ .*

### 3.2. Proofs and Corollaries

*Proof.* Let  $\varepsilon > 0$  be given. Since  $a_n \rightarrow L$  and  $c_n \rightarrow L$ , there exist  $N_1, N_2 \in \mathbb{N}$  such that:

- $|a_n - L| < \varepsilon$  for all  $n > N_1$
- $|c_n - L| < \varepsilon$  for all  $n > N_2$

Let  $N = \max\{N_0, N_1, N_2\}$ . For  $n > N$ , we have:

$$L - \varepsilon < a_n \leq b_n \leq c_n < L + \varepsilon \tag{3}$$

Thus  $|b_n - L| < \varepsilon$ , completing the proof. □

**Corollary 3.1.1.** *If  $(b_n)$  is squeezed between two sequences converging to zero, then  $b_n \rightarrow 0$ .*

<sup>1</sup>This is a footnote demonstrating the feature. Footnotes can contain **formatted text** and even code.

<sup>2</sup>Another footnote with additional information.

### 3.3. Lemmas and Remarks

**Lemma 3.2** (Triangle Inequality). *For all  $x, y \in \mathbb{R}$ , we have  $|x + y| \leq |x| + |y|$ .*

**Remark 3.1.** *The proof directives (Definition 3.1, Theorem 3.1) are automatically numbered and can be cross-referenced throughout the document.*

## 4. Methods

We use the standard CAS template structure provided by Elsevier, adapted for use with the `jtex` templating system.

### 4.1. Mathematical Content

The templates support full LaTeX math. For example, the quadratic formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \tag{4}$$

And inline math like  $E = mc^2$ . Equations can be cross-referenced: see (4).

### 4.2. Admonitions

Admonitions (callouts) are useful for highlighting important information:

**Note**

This is a note admonition. Use it to highlight supplementary information that readers should be aware of.

**Warning**

This is a warning. Use it to alert readers about potential pitfalls or important caveats in your methodology.

**Tip**

Tips can provide helpful suggestions for readers applying your methods.

### 4.3. Code Blocks

Code blocks with syntax highlighting are supported:

```
import numpy as np

def quadratic_formula(a, b, c):
    """Solve ax^2 + bx + c = 0"""
    discriminant = b**2 - 4*a*c
    x1 = (-b + np.sqrt(discriminant)) / (2*a)
    x2 = (-b - np.sqrt(discriminant)) / (2*a)
    return x1, x2
```

**Figure 2:** Example Python implementation

As shown in Program 2, code can be captioned and cross-referenced.

### 4.4. Tables

MyST tables convert cleanly to LaTeX:

Results are summarized in Table 1.

List tables provide an alternative syntax useful for longer content:

**Table 1**

Comparison of different methods

Method	Accuracy	Speed
Baseline	85.2%	Fast
Proposed	<b>92.1%</b>	Medium
Oracle	98.5%	Slow

**Table 2**

Dataset statistics

Dataset	Samples	Features
Training	10,000	256
Validation	2,000	256
Test	3,000	256

**Table 3**

Comprehensive table showcasing CAS template features

Category		Measurements		
Type	Description (details)	Status	Value	Count
Group A	Item 1	✓	12.34	100
	Item 2	✓	5.67	250
	Item 3	–	89.01	50
Group B	Item 4	✓	23.45	175
	Item 5	–	6.78	320

Features: *booktabs* rules, *multirow* row spanning, *makecell* line breaks, *dcolumn* decimal alignment, *colortbl* colors, *array* column formatting.

## 4.5. Raw LaTeX Tables

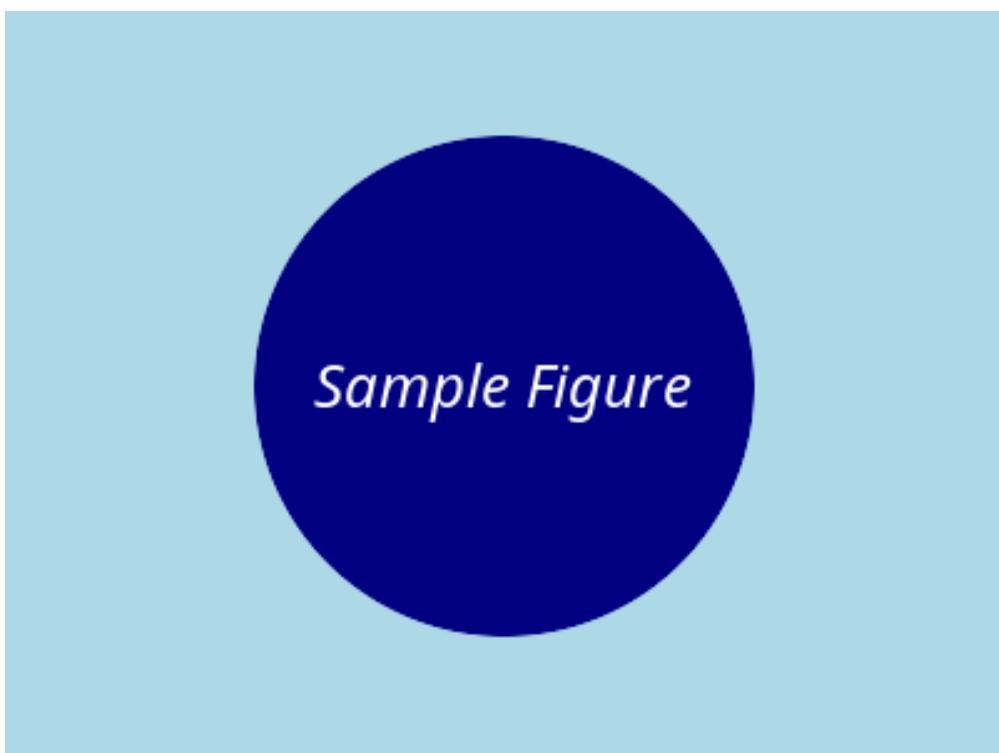
For complex tables requiring advanced features, use raw LaTeX blocks. The CAS templates include *booktabs*, *multirow*, *makecell*, *array*, *colortbl*, and *dcolumn* packages:

## 5. Results

The template successfully renders:

- Author information with ORCID
- Multiple affiliations
- CRediT author contributions
- Keywords
- Abstract and highlights
- Full document content

As shown in Figure 3, the template properly handles figure placement and captions.



**Figure 3:** A sample figure demonstrating image support in the template. This figure shows a placeholder image that would typically contain research results or visualizations.

## 6. Discussion

This approach enables researchers to write in MyST Markdown while producing publication-ready documents that meet Elsevier's submission requirements.

### See Also

For more information on MyST Markdown features, visit the [MyST documentation](#).

## 7. Conclusion

The Elsevier CAS MyST template provides a modern workflow for scientific writing while maintaining compatibility with traditional journal submission systems.

## Appendix

### A. Supplementary Methods

This appendix provides additional methodological details that support the main text.

#### A.1. Data Processing

The data was processed using standard procedures as described in the literature.

## B. Additional Tables

Parameter	Value	Unit
Alpha	0.05	-
Beta	1.23	m/s
Gamma	456	kg

## CRediT authorship contribution statement

**Alan Lujan:** Conceptualization, Methodology, Software. **Christopher Carroll:** Supervision, Writing – review editing.

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