Graphical Abstract

A Sample Article for Elsevier CAS Template

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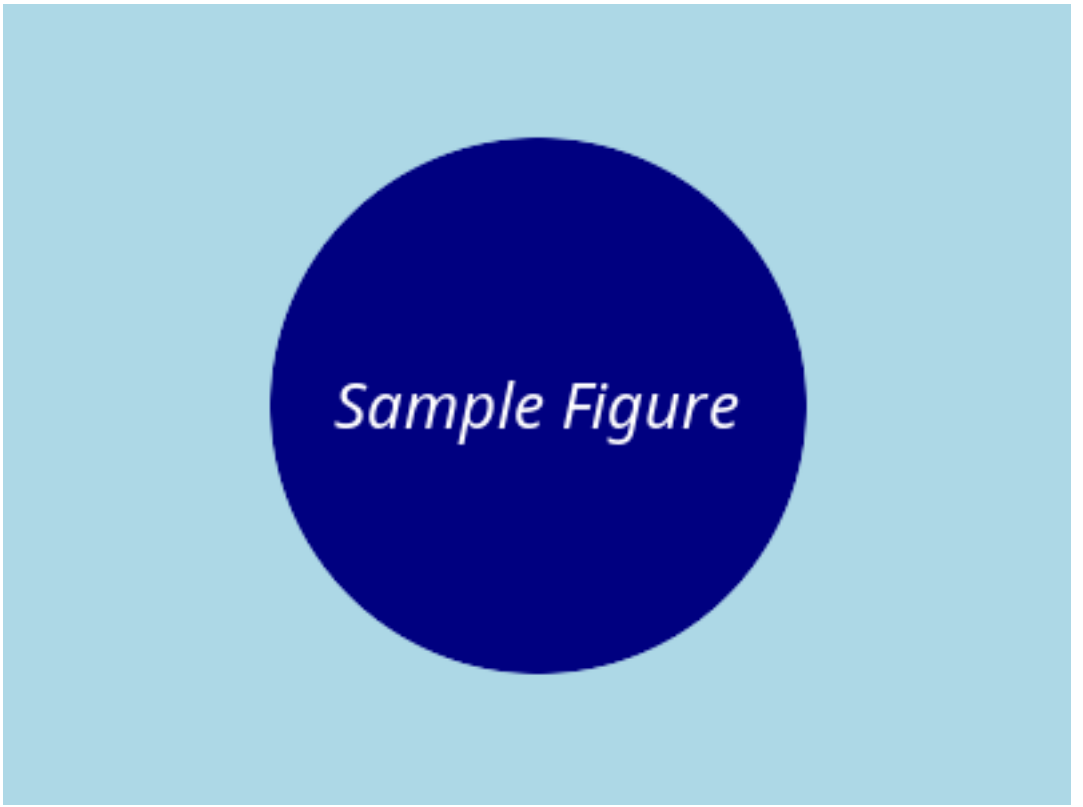

Highlights

A Sample Article for Elsevier CAS Template

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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

Keywords:
MyST Markdown
Elsevier
LaTeX
CAS Template

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.

1. Introduction

This document demonstrates the integration of MyST Markdown [1] with Elsevier's CAS templates. MyST provides a powerful authoring experience while maintaining compatibility with traditional LaTeX journal requirements [4].

1.1. Background

Scientific publishing has traditionally relied on LaTeX for high-quality typesetting [5]. 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 [2]
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 [3] 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_2O, CO_2. For ordinals, use superscripts: the 4th of July, 1st place.

2.2. Quotations

Block quotes are useful for highlighting important passages:

*Corresponding author
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ORCID(s): 0000-0000-0000-0000 (A. Lujan)

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[1] which are automatically numbered and placed at the end of the document. You can have multiple footnotes[2] 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 $\lim_{n\to\infty} a_n = L$.

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*

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

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

3.2. Proofs and Corollaries

Proof. Let $\varepsilon > 0$ be given. Since $a_n \to L$ and $c_n \to L$, 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 $b_n \to 0$.*

[1] This is a footnote demonstrating the feature. Footnotes can contain **formatted text** and even `code`.

[2] 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	**92.1%**	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.

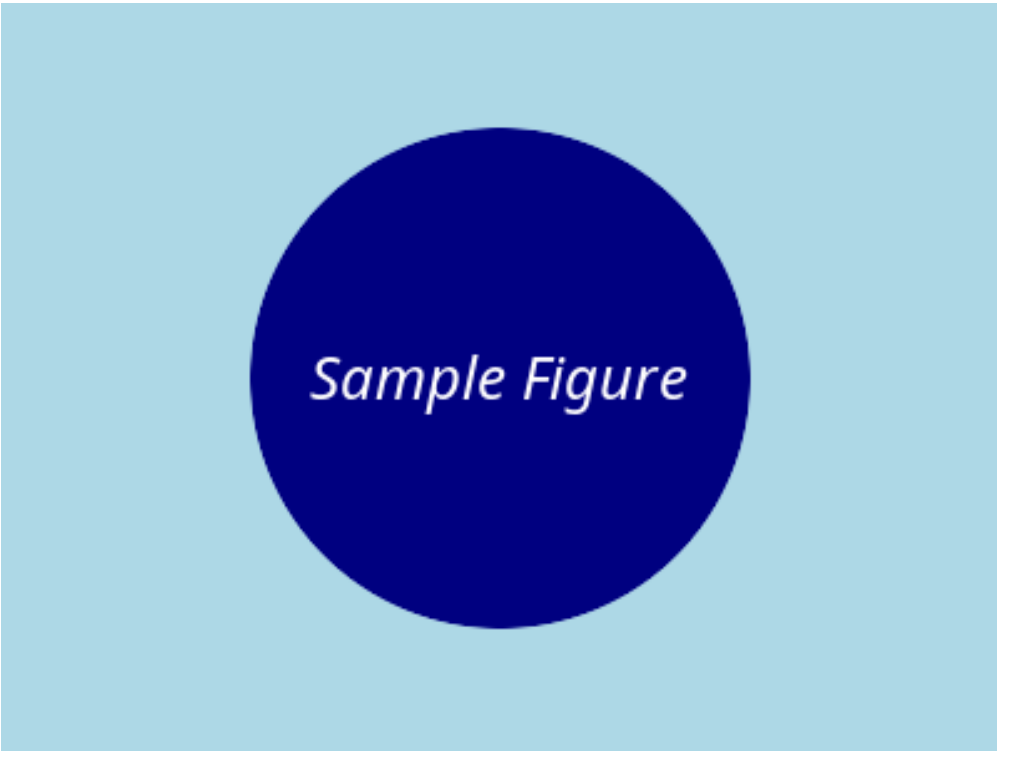

Figure 3: A sample figure demonstrating image support in the template. This figure shows a placeholder image that would typically contain research results or visualizations.

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.

References

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