

The Gentle Art of Abstract Writing

An *abstract* is essentially a written preview, or “teaser,” for your talk. It lets a potential listener decide whether or not to come to your talk and answers the questions “who?,” “what?,” “when?,” and “where?,” and oftentimes it briefly addresses the question “how?.”

Many of these questions are answered in a quick and straightforward fashion, before the abstract itself even begins! For instance, in answering “who?” one typically gives the name and affiliation of the speaker:

Dr. Josephine J. Johnson, Dunderry Polytechnic Institute.

The queries “when?” and “where?” are answered simply by giving the time and location of the scheduled talk, as soon as they are known:

Halsey Hall, Room 2033 B,
1:00 a.m., Monday, October 2nd.

Please note that it is generally *not* the speaker’s job to provide time and location for the talk; this might be provided instead by a conference or seminar organizer.

The other questions will involve a little more information.

Answering “what?” typically involves both the title of the talk (generally the first piece of information given, preceding the abstract proper) and much of the content of the abstract itself. It is never a bad idea to include at least two or three sentences providing the potential auditor with a background for the topic to be addressed by the talk: in what field did the central problem arise? How does the problem addressed fit in with the general theory? What other scholars have considered the problem in the past? Usually this information is provided as clearly and concisely as possible, without great use of technical terminology.

Once the scene is set, the speaker must indicate the topic of the talk itself: what theorem will be proven? What particular aspect of the field will be covered? Will connections with other results be made, and in what way?

Depending on the nature of the intended audience, the speaker may wish to include a few more technical details concerning the course the talk will take. How, for instance, will the speaker attempt to demonstrate the stated results? Of what nature will the speaker’s proof be?

Finally, an abstract may often close with a line indicating the background the listener should be expected to have: “This talk will be accessible to an undergraduate audience,” or “some knowledge of basic group theory is assumed.”

On the reverse are a few abstracts, for actual talks given by visitors to the REU. Further examples can be found on the REU website, as well as on the website for the UNC Asheville Mathematics Department’s Research Seminar, and really all over the place on the web.

Title: *What role do glial cells play in networks of neurons?*

Abstract: Our brains are composed of networks of cells, including neurons and glial cells. While the significance of neurons has been well-established by biologists, the role of glial cells is less understood. One hypothesis is that glial cells enhance neural communication between neurons that they are close to, while suppressing communication between more distant neurons. In this talk, I will describe the behavior of neurons and glial cells and discuss a test of this proposed mechanism using mathematical models.

Title: *Trees, ultrametrics, and groups*

Abstract: This talk is about the symmetries of infinite trees. Of particular interest are the symmetries that exist after removing a finite subtree. I will discuss two ways that these symmetries might be explored. The first involves the geometry of an ultrametric space at infinity. The second uses linear algebra to define a group of symmetries at infinity. I will illustrate these concepts with examples.

Title: *From finite graphs to dynamical systems on infinite graphs and resulting questions in combinatorics, probability, and number theory*

Abstract: Start with a finite directed graph. Consider the set of infinite walks that follow the edges of this graph. At least two interesting transformations are defined on the space of paths followed by a walker, which are represented on an infinite, directed, graded graph: the shift and the adic or successor map. Keeping track of the number of times each edge has been traversed produces a new graph and a new dynamical system. Adding edges according to a fixed reinforcement scheme generates yet another system. Investigating the properties of these systems leads to open problems in combinatorics and number theory, such as divisibility by primes of binomial coefficients and Eulerian numbers.