Wed 5 Dec 2007 | Het Pand | Gent | Belgiun

Plenary session | 17:45-18:30

Modern myths Shortcomings in scientific writing



Jean-luc Doumont www.principiae.be

UGent – FirW Wed 5 Dec 2007

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Prose is architecture, not interior decoration

— Ernest Hemingway

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Complicated writing Purpose and audience

Chronological writing The theorem approach

Depersonalized writing Clear, accurate, concise

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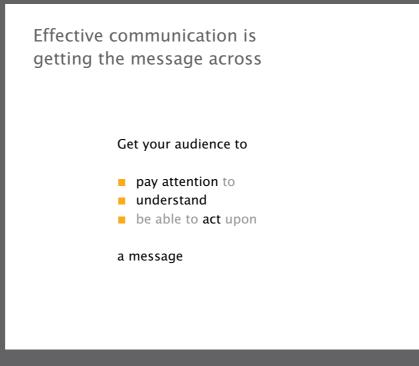
Complicated writing Purpose and audience

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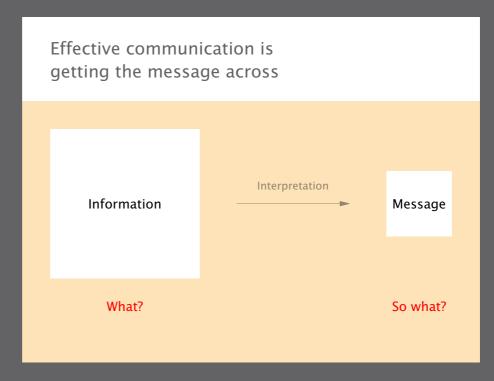
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Effective communication is optimization under constraints

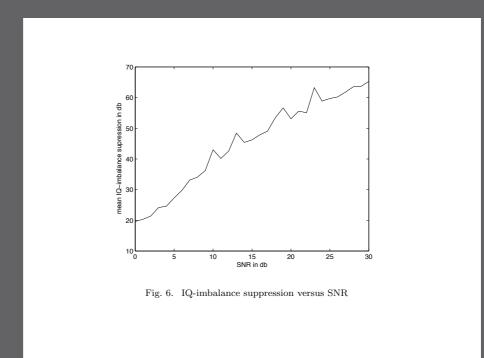
Get your audience to

- pay attention to
- understand
- be able to **act** upon

a maximum of message(s), given constraints

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Academic writing is a poor preparation for communication in the real world

	Academia	Real world
Audience	Single, well-defined More knowledgeable Captive	Multiple, unpredictable Less knowledgeable Selective
Purpose	Demonstrate knowledge	Inform, convince,

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To communicate effectively, make sure you have messages

Take distance from your work

to identify motivation and outcome

Recognize opportunity

such as captions of figures

Be selective about contents

Express complexity in a simple way

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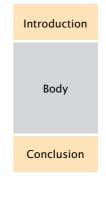
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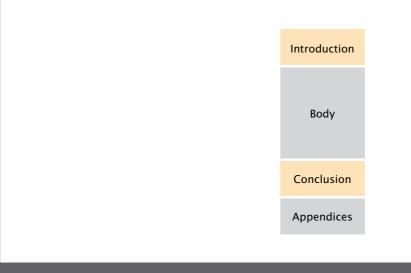
Most documents are chronological...



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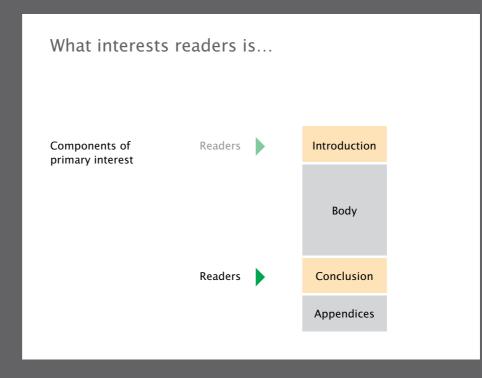
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Most documents are chronological, except for the appendices



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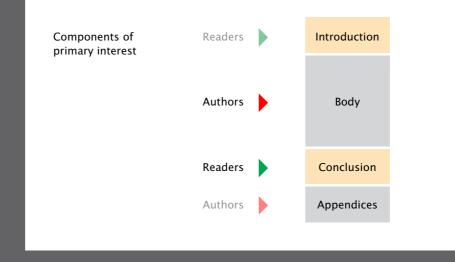
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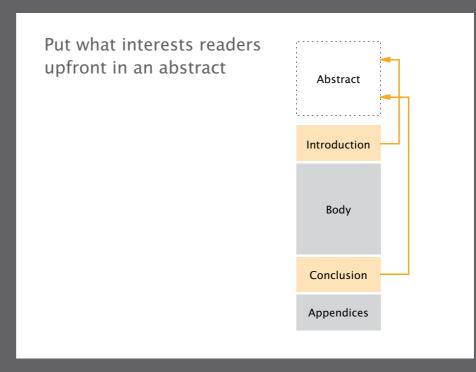
What interests readers is not what interests authors

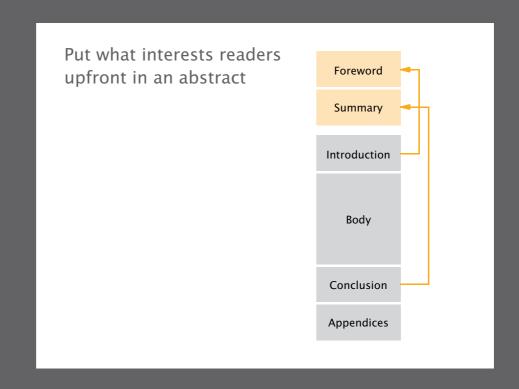


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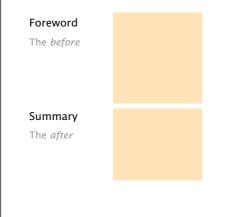




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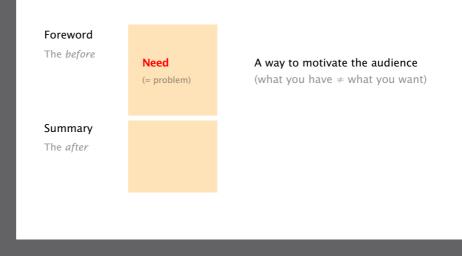
An effective summary includes both a *foreword* and a *summary*



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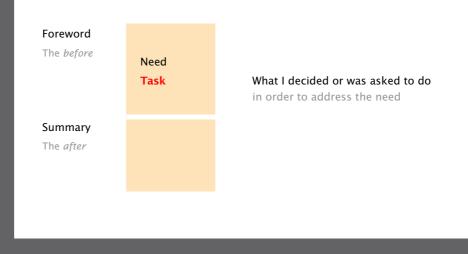
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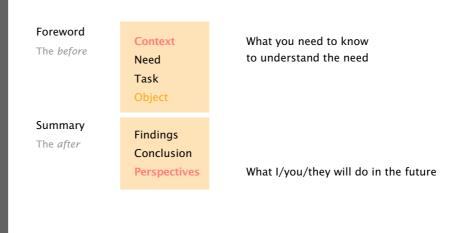
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An effective abstract comprises four layers



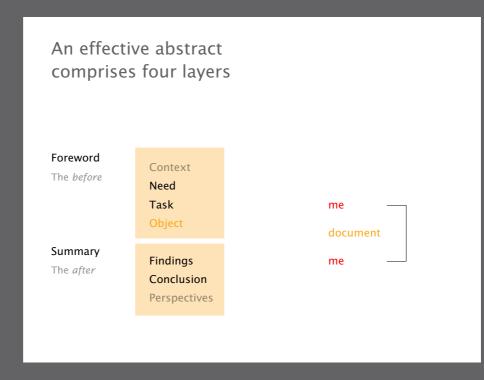
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An effective abstract comprises four layers Foreword Context The *before* Need Task document Summary Findings The *after* Conclusion Perspectives

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An effective abstract comprises four layers Foreword Context The *before* Need you Task me document Summary Findings me The *after* Conclusion you Perspectives

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An effective abstract comprises four layers Foreword Context past The *before* Need you Task me document Summary Findings me The *after* Conclusion you Perspectives future

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The foreword (*before*) motivates the readers



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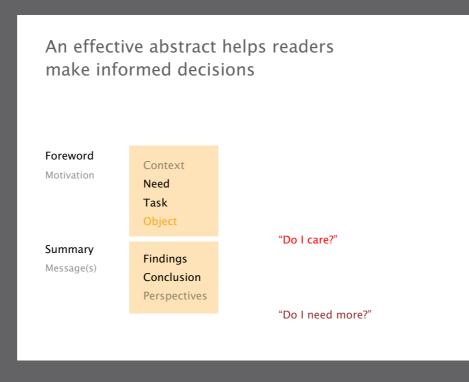
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The summary (*after*) gets messages across



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This paper describes PLTO, a link-time instrumentation and optimization tool we have developed for the Intel IA-32 architecture. A number of characteristics of this architecture complicate the task of link-time optimization. These include a large number of op-codes and addressing modes, which increases the complexity of program analysis; variable-length instructions, which complicates disassembly of machine code; a paucity of available registers, which limits the extent of some optimizations; and a reliance on using memory locations for holding values and for parameter passing, which complicates program analysis and optimization. We describe how PLTO addresses these problems and the resulting performance improvements it is able to achieve.

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lenary session | 17:45-18:

On simple RISC architectures, post-link-time optimization of executable programs delivers significant performance improvements. However, the applicability of this technique has not yet been evaluated for more complex CISC architectures such as the widely used Intel IA-32 processor family. We have developed PLTO, a link-time instrumentation and optimization tool for IA-32. This paper describes how PLTO addresses the complexities of this processor architecture and which analyses and optimizations contribute to the achieved performance improvements. Currently, PLTO achieves a moderate speedup of about 6% on average. We expect bigger speedups once we have solved a remaining problem involving significantly increased instruction cache misses.

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Context

On simple RISC architectures, post-link-time optimization of executable programs delivers significant performance improvements. However, the applicability of this technique has not yet been evaluated for more complex CISC architectures such as the widely used Intel IA-32 processor family. We have developed PLTO, a link-time instrumentation and optimization tool for IA-32. This paper describes how PLTO addresses the complexities of this processor architecture and which analyses and optimizations contribute to the achieved performance improvements. Currently, PLTO achieves a moderate speedup of about 6% on average. We expect bigger speedups once we have solved a remaining problem involving significantly increased instruction cache misses.

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lenary session | 17:45-18:3

Need

On simple RISC architectures, post-link-time optimization of executable programs delivers significant performance improvements. However, the applicability of this technique has not yet been evaluated for more complex CISC architectures such as the widely used Intel IA-32 processor family. We have developed PLTO, a link-time instrumentation and optimization tool for IA-32. This paper describes how PLTO addresses the complexities of this processor architecture and which analyses and optimizations contribute to the achieved performance improvements. Currently, PLTO achieves a moderate speedup of about 6% on average. We expect bigger speedups once we have solved a remaining problem involving significantly increased instruction cache misses.

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Plenary session | 17:45-18:3

On simple RISC architectures, post-link-time optimization of executable programs delivers significant performance improvements. However, the applicability of this technique has not yet been evaluated for more complex CISC architectures such as the widely used Intel IA-32 processor family.

Task

We have developed PLTO, a link-time instrumentation and optimization tool for IA-32. This paper describes how PLTO addresses the complexities of this processor architecture and which analyses and optimizations contribute to the achieved performance improvements. Currently, PLTO achieves a moderate speedup of about 6% on average. We expect bigger speedups once we have solved a remaining problem involving significantly increased instruction cache misses.

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Object

On simple RISC architectures, post-link-time optimization of executable programs delivers significant performance improvements. However, the applicability of this technique has not yet been evaluated for more complex CISC architectures such as the widely used Intel IA-32 processor family. We have developed PLTO, a link-time instrumentation and optimization tool for IA-32. This paper describes how PLTO addresses the complexities of this processor architecture and which analyses and optimizations contribute to the achieved Findings performance improvements. Currently, PLTO achieves a moderate speedup of about 6% on average. We expect bigger speedups once we have solved a remaining problem involving significantly increased instruction cache misses.

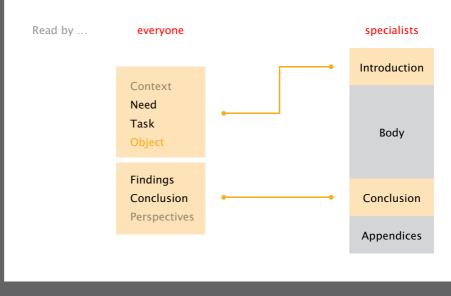
Perspect.

On simple RISC architectures, post-link-time optimization of executable programs delivers significant performance improvements. However, the applicability of this technique has not yet been evaluated for more complex CISC architectures such as the widely used Intel IA-32 processor family. We have developed PLTO, a link-time instrumentation and optimization tool for IA-32. This paper describes how PLTO addresses the complexities of this processor architecture and which analyses and optimizations contribute to the achieved performance improvements. Currently, PLTO achieves a Conclusion moderate speedup of about 6% on average. We expect bigger speedups once we have solved a remaining problem involving significantly increased instruction cache misses.

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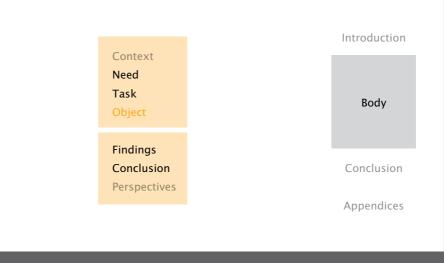
Abstract *versus* full document: much more than copy/paste



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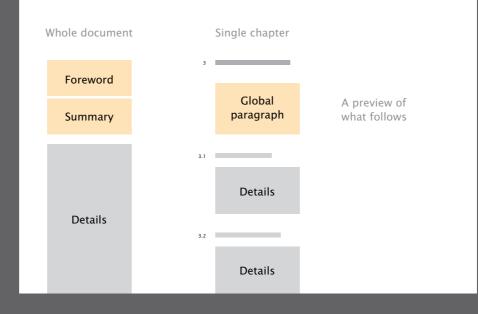
First tell the **beginning** and the **end**, then the rest—whether short or long



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Apply the theorem-proof approach recursively



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Single-use, disposable medical devices are prepackaged and sterilized by the manufacturer. The packaging is chosen to provide protection for the product, to facilitate sterilization, to maintain sterility, and to be easy to use. Reusable devices, by contrast, must be durable both in service and in their ability to withstand repeated sterilization. ...

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Single-use, disposable medical devices are prepackaged and sterilized by the manufacturer. The packaging is chosen to provide protection for the product, to facilitate sterilization, to maintain sterility, and to be easy to use. Reusable devices, by contrast, must be durable both in service and in their ability to withstand repeated sterilization. ...

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Medical devices may be broadly divided into two categories, disposable and reusable, having different sterilization requirements.

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Prepare the readers for content and structure, with a topic sentence

announces the structure

Medical devices may be broadly divided into two categories, disposable and reusable, having different sterilization requirements.

announces the contents

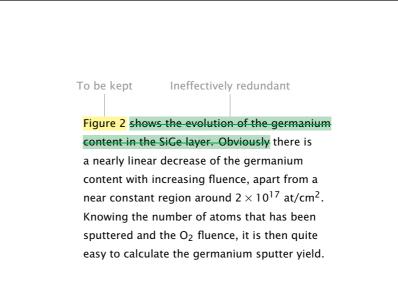
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Figure 2 shows the evolution of the germanium content in the SiGe layer. Obviously there is a nearly linear decrease of the germanium content with increasing fluence, apart from a near constant region around 2×10^{17} at/cm². Knowing the number of atoms that has been sputtered and the O₂ fluence, it is then quite easy to calculate the germanium sputter yield.

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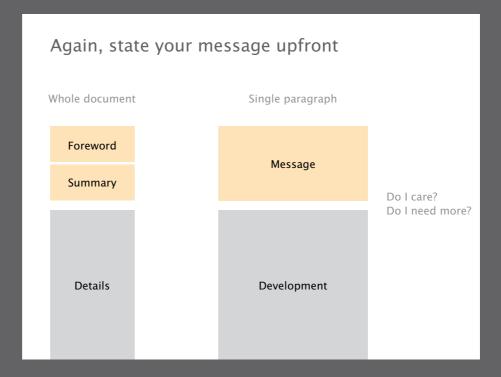
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The germanium content decreases linearly with increasing fluence apart from a near constant region around 2×10^{17} at/cm² (Figure 2).

Knowing the number of atoms that has been sputtered and the O_2 fluence, it is then quite easy to calculate the germanium sputter yield.

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In scientific writing, no one ever seems to do anything

John evaluated the algorithm.

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In scientific writing, no one ever seems to do anything

John evaluated the algorithm

The algorithm was evaluated.

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In scientific writing, no one ever seems to do anything

John evaluated the algorithm

The algorithm was evaluated

An evaluation of the algorithm was conducted.

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In Figure 3, it can be seen that a very good agreement is achieved between ...

"it can be seen that" site:ugent.be 600 hits

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Main clause	
In Figure 3, it can be seen that a very	
good agreement is achieved between	
Main information	

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When writing a complex sentence, place the main information in the main clause

First, suppress the main clause

In Figure 3, it can be seen that a very good agreement is achieved between ...

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When writing a complex sentence, place the main information in the main clause

First, suppress the main clause

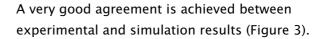
In Figure 3, it can be seen that a very good agreement is achieved between ...

Then, put back what you may have lost

A very good agreement is achieved between experimental and simulation results (Figure 3).

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Express the action with a verb, not with a noun

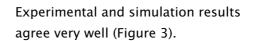
Experimental and simulation results agree very well (Figure 3).

A very good agreement is achieved between

experimental and simulation results (Figure 3).

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Suppress unnecessary words

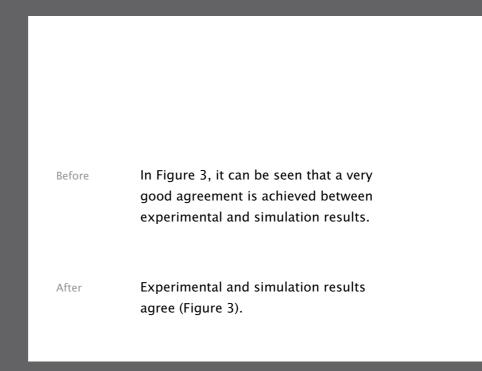
Experimental and simulation results agree very well (Figure 3).

2

Experimental and simulation results agree (Figure 3).

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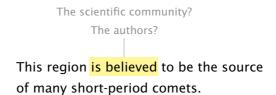
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This region is believed to be the source of many short-period comets.

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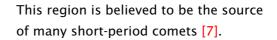
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Who believes this?

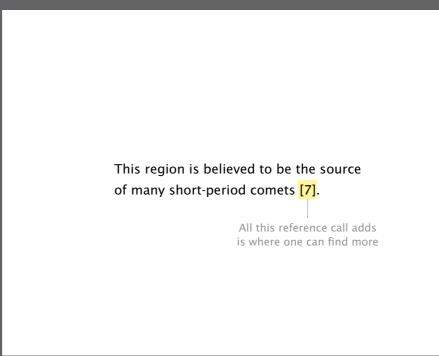
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Identifying people when people matter is an issue of accuracy, not of style

23 700 000	This region is believed to be the source of many short-period comets.
37 600 000	It is assumed that initially the Earth started out with vast amounts of iron dissolved in the world's acidic seas.
40 700 000 Google hits	However, it is recommended that women who will be pregnant during flu season get the shot.

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Identify people (when people matter) in whichever way is accurate

In the third person

Astronomers believe this region to be the source ... Asimov *et al.* believe this region to be ... [7]

In the first person

We believe this region to be the source of ... Our observations suggest this region to be ...

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For maximum impact, use *we* to mean *we, the authors* only

Avoid we for communication purposes

Focus on the document (Section 3.2 presents)

Avoid we to designate everyone

Use one-or change the construction

Avoid we to designate a single author

or say who else is included (My supervisor and I)

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To write better papers and theses, challenge the traditional writing style

Focus on getting the message across

not on displaying the extent of your knowledge

Write reader-friendly documents

Put first what readers want to know first

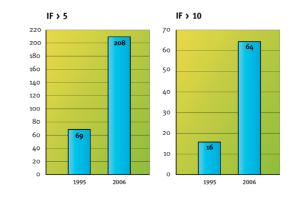
Question widespread taboos

Have a good reason for how you write

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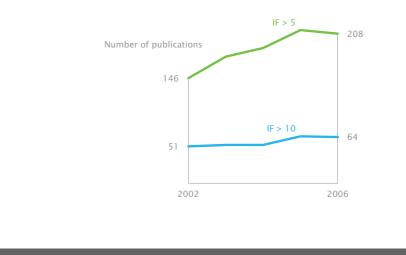
Nonverbal aspects, such as graphs, are up for improvement, too



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Nonverbal aspects, such as graphs, are up for improvement, too



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Jean-luc Doumont www.principiae.be

Wishing you every success with your scientific writing