

## $\text{\LaTeX}$ -course 4<sup>th</sup> session: Using (or making) external packages and tools in $\text{\LaTeX}$

$\text{\TeX}$ niCie

A-Eskwadraat

12 december 2017



# Recap

We have seen how to make documents, how to make formulas and how to place pictures.

This week: *everything else*.



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This week: *everything else*.



# Today



# Packages

## What are they?

- Give extra functionality
- There are packages to add pictures like *graphicx*
- But there are also the home-made package like those of A-Eskwadraat



# How to load packages

## How to load

- Use the usepackage command
- Input the required package i.e. `\usepackage{fullpage}`
- The first time you use a certain package, you should get a pop-up
- If this is not the case we have to do a bit more work...



# An example

## An example

```
\documentclass{article}  
\usepackage{marvosym,hyperref}  
  
\begin{document}  
A short example.  
\end{document}
```

We will now show some examples you might actually use.



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# Package for including PDFs

## The package

- Last week we added pictures, but sometimes you want to add PDFs
- For this we will need the package *pdfpages*
- This package allows full-page PDF inserts
- The syntax is:

```
\includepdf[pages = {page number}]{thesis.pdf}
```

## Examples

```
\includepdf{thesis.pdf}
```

```
\includepdf[pages = {2}]{thesis.pdf}
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```

# De beamer-class

A-Eskwadraat T<sub>E</sub>Xn<sub>i</sub>Cie  
hektex@a-eskwadraat.nl

23 juni 2014

## 1 Introductie

De `beamer`-class vormt een standaard presentatie van A-Eskwadraat. Dit document legt uit hoe je een presentatiemaakt en hoe de verschillende commando's werken.

## 2 De class laden

Met `\documentclass{optics}{beamer}` bovenaan je document laad je de `beamer`-class. De `{optics}` (gescheiden door komma's) zijn:

**english**

Zorgt dat het contract in het Engels is.

Overige opties worden doorgegeven aan de `article`-class.

## 3 Informatie opgeven

Er zijn allerlei dingen die je kunt of moet instellen. Dat gebeurt door middel van allerlei commando's die je vrijwel overal tussen `\documentclass{beamer}` en `\begin{document}` (zie sectie 4) kunt plaatsen.

### 3.1 Verplicht

Sommige commando's zijn 'verplicht', als je ze weglaat zal `beamer` klagen, maar zijn best doen om toch een presentatie te produceren.

Er zijn nog geen verplichte commando's.

### 3.2 Optioneel

De volgende commando's kun je gebruiken om optionele informatie op te geven.

Er zijn nog geen optionele commando's.

# Wrapfigures

## The package

- For nice typesetting, you sometimes need to place text around a figure
- The package *wrapfig* makes this possible.
- It adds an `{wrapfigure}` environment, much like the `{figure}` environment
- The syntax is:

```
\begin{wrapfigure}{<position>}{<width>}  
<includegraphics-commands>  
\end{wrapfigure}
```

## Example

```
\begin{wrapfigure}{R}{0.3\textwidth}  
\centering  
\includegraphics[width=0.25\textwidth]{mandelbrot.png}  
\caption{Mandelbrot}  
\end{wrapfigure}  
\lipsum[1]
```



Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

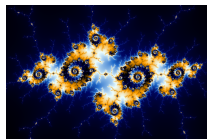


Figure: Mandelbrot

# Other packages:

## Useful packages

- *subcaption* (or the older *subfig*): Put multiple small pictures in a single figure
- *geometry*: Sets margins and allows full user control.
- *babel*: Correct hyphenation for multiple languages.
- *tikz*: Draw vector images, can be extremely useful.
- *fancyhdr*: Gives fancy headers and footers, which includes the page number, chapter, etc.

You might already have seen:

- *hyperref*: Makes hyperlinks and references clickable.
- *amsmath*, *amssymb*: More math symbols.

# CTAN Documentation

The documentation of all these (and many more) packages can be found on [ctan.org](http://ctan.org)





# Document classes

## What are they?

- Until now, you have been using the 'article' class. This class is the best in short articles, like an articles one would publish in a paper.
- For more general purposes, there are better classes. You will probably at some point use one of the following:
- The 'report' and 'book' class are for longer documents, like a thesis.
- The 'beamer' class for presentations (like the one you're looking at right now)

# Document classes: general options

- `\documentclass[opt1,opt2,...]{..}`
- `{10pt}`, `{11pt}`, `{12pt}`: text size
- `{a4paper}`, `{a5paper}`, `{letterpaper}`, ...: paper size
- `{fleqn}`, `{leqno}`: equations left aligned
- `{twocolumn}`: full document in two column style
- `{twoside}`, `{oneside}`: full document for twosided/onesided
- `{landscape}`: landscapemode



# Document classes: report

- `\documentclass{report}`
- Ideal for papers or theses
- Structural change, starting with `\chapter{}`
- New style for chapter and titlepage



# Document classes: book

- `\documentclass{book}`
- Ideal for books (or long PhD-theses)
- Structural change:
  - `\chapter{}`
  - `\frontmatter{}`
  - `\mainmatter{}`
  - `\endmatter{}`
- Standard header with pagenumber and chapter name
- Standard *twosided*



# Document classes: book (example)

## Contents

<b>Foreword</b>	ii
<b>Dummy entry</b>	iii
<b>1 First Chapter</b>	<b>1</b>
1.1 Second section	3
<b>2 Heading on Level 0 (chapter)</b>	<b>5</b>
2.1 Heading on Level 1	5
2.1.1 Heading on Level 2 (subsection)	6
2.2 Lists	9
2.2.1 Example for list (itemize)	9
2.2.2 Example for list (enumerate)	12
2.2.3 Example for list (description)	15

Ir a la página 5

# Document classes: beamer

- Easy presentations, with formulae en figures!
- Differs greatly from article, but don't be intimidated
- Each seperate page is enclosed in the *frame* environment
- Adds a few tools for presentations, like *blocks* and *columns*



# Document classes: beamer

## Blocks

- The *block*, *exampleblock* and *alertblock* environments give an easy way to add layout to your slides
- Always make sure to give each block a title

### Title (block)

In here, you write some text or formulae

### Title (exampleblock)

Give an example

### Title (alertblock)

This is important!

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This is important!



# Example code

```
\pause
```

```
\begin{block}{Title (block)}
```

In here, you write some text or formulae

```
\end{block}
```

```
\begin{exampleblock}{Title (exampleblock)}
```

Give an example

```
\end{exampleblock}
```

```
\begin{alertblock}{Title (alertblock)}
```

This is important!

```
\end{alertblock}
```



# Document classes: beamer

- The beamer class supports (sub)sections, just like the article class
- The command `\tableofcontents` works as well to provide a t.o.c. on a slide
- Additionally, this provides an overview of the sections in the header of each slide



# Document classes: beamer

## Animations

- Like PowerPoint, the beamer class can make the slide appears in smaller parts
- To chop the slide into these parts, use the `\pause` command
- Alternatively, if you're in an 'itemize' environment, you can manipulate each item separately using `\item< m - n >` (appears in  $m$ , disappears in  $n$ )

## Handout

Using `\documentclass[handout]{beamer}` skips all the animations, which makes it much easier to print.



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# A-Eskwadraat packages

- A-eskwadraat has several home-made packages
- Most used are the minutes (notulen) package, the letter package and the invoice (factuur).
- We will give a small introduction to the minutes package, for every other package please visit:
- Url: <https://www.a-eskwadraat.nl/Vereniging/Commissies/hektex/packages>



# The minutes class

- Making minutes is non-trivial
- Having a dedicated package for minutes helps
- For this, we use the A-Eskwadraat package *notulen*





# Notulen TEXniCie

aanwezig: Robin, Peter, Pepijn, Eva, Aldo

1 oktober 2017

## 1 Vaststellen notulist

*Aldo zal vandaag notuleren.*

*Iemand maakt een opmerking*

## 2 Vorige notulen

**Actiepunt:** *Peter* maakt een begroting voor de cursus

## 3 Sluiting

Eva sluit de vergadering om 19:45.

## Actiepunten

*Peter*  
maakt een begroting voor de cursus . . . . . I

# Example code

```
\documentclass{notulen}
\title{Notulen TEXniCie}
\date{1 oktober 2017}
\author{aanwezig: Robin, Peter, Pepijn, Eva, Aldo}
\begin{document}
\maketitle
\section{Vaststellen notulist}
\naam{Aldo} zal vandaag notuleren.
\opm{\naam{Iemand} maakt een opmerking}
\section{Vorige notulen}
\ap{Peter}{maakt een begroting voor de cursus}
\section{Sluiting}
Eva sluit de vergadering om 19:45.
\aplijstpp
\end{document}
```



## Lay-out

- Using `\author` you declare the attendees
- Sections etc work the same as in the article class
- Use `\naam` to put emphasis on a name
- Use `\opm` ('opmerking') for less important remarks

## Assigned Tasks (Actiepunten)

- The main goal of minutes is to remind you of your tasks. For this, there are the *assigned tasks*
- You mark an assigned task by `\ap{<name>}{<TODO>}`
- At the end of the document write either `\aplijst` or `\aplijstpp` for a nice list with all assigned tasks.  
(‘aplijstpp’ = “actiepunten list per person”)

# Installing

- The packages can be found on <https://www.a-eskwadraat.nl/Vereniging/Commissies/hektex/>
- The general instructions for installing by hand are also explained there, which can be applied to other packages (in general).

## English support

Most A-eskwadraat classes have (some) english support. You use this by calling the documentclass with optional argument 'english'.

Example: `\documentclass[english]{notulen}`

# A-eskwadmaat beamer style

- You may have notice that this beamer presentation is not in the standard  $\text{\LaTeX}$  theme, but in an A-eskwadmaat theme.
- If you also want to use this beautiful theme, put `\usetheme{aes2}` in the preamble of your beamer document.



# Googling Problems

If you have forgotten the symbol for something:

[detexify.kirelabs.org](http://detexify.kirelabs.org)

If you want to know how something worked:

[en.wikibooks.org/wiki/LaTeX](http://en.wikibooks.org/wiki/LaTeX)

If you want something exotic or have an error:

[tex.stackexchange.com/](http://tex.stackexchange.com/)

And never forget CTAN: [ctan.org](http://ctan.org)

Time for a break!



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# New commands

The general form of a  $\text{\LaTeX}$ -command is:

```
\commandname[optional argument]{first argument}{second argument}
```

Creating your own custom commands:

```
\newcommand{<name>}[<number of arguments>]{<definition>}
```

Arguments can be included in the definition with #1, #2, #3, etc...





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Creating your own custom commands:

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\newcommand{\name}[\number of arguments]{\definition}
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Arguments can be included in the definition with #1, #2, #3, etc...



# New commands: Example

Creating a new command to easily set pictures

```
\newcommand{\image}[3]{  
  \begin{figure}  
    \includegraphics{#1}  
    \label{#2}  
    \caption{#3}  
  \end{figure}  
}
```

...and using it with:

```
\image{fig.png}{fig:plotStars}{Caption}
```



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...and using it with:

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\image{fig.png}{fig:plotStars}{Caption}
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# New environments

New environments can be defined in roughly the same way:

```
\newenvironment{name}[\langle number of arguments \rangle]  
  {\langle before the body code \rangle}  
  {\langle after the body code \rangle}
```

Arguments for an environment are placed after `\begin{name}`



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Arguments for an environment are placed after `\begin{name}`



# New environments: Example

Creating a new environment that states a kingly message

```
\newenvironment{king}[0]
```

```
{\rule{1ex}{1ex}\hspace{\stretch{1}}}
```

```
{\hspace{\stretch{1}}\rule{1ex}{1ex}}
```

...and using it with:

```
\begin{king} My humble subjects \end{king}
```

To obtain:



My humble subjects



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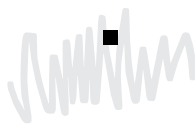
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# Your very own package

- Now that you have learned how to make your own commands, it would be nice if you could reuse (for every hand-in exercise, for instance)
- You can always put everything in the preamble, but it can be done better
- To do so, we will create our own package



# Your very own package

- To make a package you simply save any tex file as package.sty
- Then simply put all commands one has made into this document
- And call upon your package, as usual:  
`\usepackage{package.sty}`



## Your own package

- You can also include all other packages one uses in this document
- If you do it right, you only need to include your own package
- Install it just as you installed the A-Es packages

## Example

```
\newcommand{pie}{Pietje}  
\newcommand{kl}{Klaasje}  
\newcommand{he}{Henkie}  
\usepackage{graphicx}  
\usepackage{tikz}
```

## Actual Example

```
\usepackage[margin=24mm]{geometry}
\usepackage{fontspec,graphicx}
\usepackage{amsfonts,amsmath,amssymb}
\usepackage{colorlinks}{hyperref}
\setmainfont[Mapping=tex-text]{Times New Roman}
\usepackage[dutch]{babel}
\setlength{parindent}{0pt}
%\newcommand{\iop}{\int_0^{2\pi}}
%\newcommand{\intinf}{\int_{-\infty}^{\infty}}
\newcommand{\pafg}[2]{\frac{\partial #1}{\partial #2}}
\newcommand{\cpx}{\mathbb{C}}
\newcommand{\reel}{\mathbb{R}}
... (etc)
```

# Crazy example: CV in LaTeX

☎ +31 6 16628632

✉ kaj-ivar@vanderwijst.com

🌐 www.vanderwijst.com

## Kaj-Ivar van der Wijst

Enthusiastic, universally interested, analytical problem solving student in his third year of college. Result driven and focused on interdisciplinary fields, with a sense of responsibility. Skilled programmer, teaching assistant and teamplayer.

### EDUCATION

2012 – present

BSc. Mathematics, Utrecht University  
BSc. Physics and Astronomy, Utrecht University  
— with a minor in Computing Science

2006 – 2012

Athénée Royal Air Pur, Seraing, Belgium (average grade: 90%)

### WORK EXPERIENCE

2014 – present

*Member of the Science Faculty Council:* I represent the Physics students by advising the board of the Faculty, through the committees Finance and Business Affairs (of which I am vice-president), and Education & Research.

2014 – present

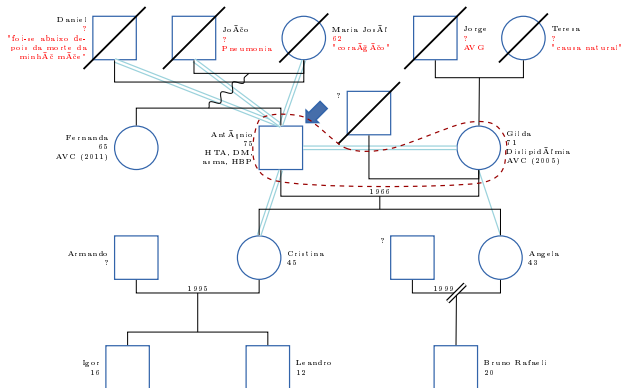
*Board member of SONS:* I am treasurer of the StudentenOverleg Natuur- & Sterrenkunde, the student union for Physics and Astronomy in Utrecht.

2013 & autumn 2014

*Teaching assistant* for the first year courses 'Calculus I' (Mathematics) and 'Data acquisition and applied analysis' (Physics).



# Crazy example: Diagrams in LaTeX with TikZ



# Collaborate in L<sup>A</sup>T<sub>E</sub>X

## A “Google Drive” environment for L<sup>A</sup>T<sub>E</sub>X

- ShareL<sup>A</sup>T<sub>E</sub>X ([www.sharelatex.com](http://www.sharelatex.com))
  - Free version, max two users
- Overleaf ([www.overleaf.com](http://www.overleaf.com))
  - Everybody with the link can edit

Both products are very similar in functionality.

## Warning!

Don't make your thesis on one of these sites, as you lose part of your rights. This is okay for homework exercises and reports, but not for things you might want to publish.

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# Final remark

Good luck with you  $\text{\LaTeX}$ -future!



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**JOIN US**

