

# Math 223, Linear Algebra

## Section 101, Fall 2018

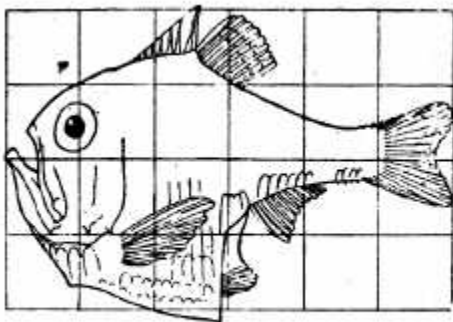


Fig. 517. *Argyropelecus Olfersi*.

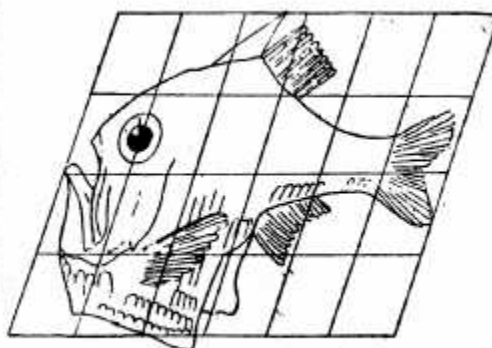


Fig. 518. *Sternoptyx diaphana*.

[D'Arcy Thompson](#)

### General Information

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Time: MWF 10:00-11:00

Place: Math Annex 1100

Instructor: [Kai Behrend](#)

Office hours:

- Fridays, 11:00-13:00, Math Annex 1213

TA: Charlotte Trainor

Office hours:

- Mondays, 12:00-13:00, LSK 300B
- Thursdays, 15:30-16:30, LSK 300C

### Syllabus

**Textbook:** K. Jänich. Linear Algebra.

This is the syllabus which lists all topics covered in this course, and for which you are responsible on the final exam.

The plan is to cover all material from the textbook. Adjustments may be made during the course, they will be listed here.

Each chapter should take up one week of classes and one homework assignment.

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**I. Sets and Maps.**

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**II. Vector Spaces.**

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**III. Dimension.**

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**IV. Linear Maps.**

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**V. Matrix Calculus.**

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**VI. Determinants.**

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**VII. Systems of Linear Equations.**

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**VIII. Euclidean Vector Spaces.**

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**IX. Eigenvalues.**

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**X. The Principal Axes Transformation.**

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**XI. Classification of Matrices.**

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## **Piazza**

signup [link](#)

We will use piazza for communication. If you have questions about any of the material, or any of the homework problems, please post them to piazza. (You can post anonymously, if you like.) Please answer questions posed by your fellow students. It is OK to edit each other's answers to improve them. Please be careful to assign your questions and discussions to the correct folder. Ask your question on piazza, rather than emailing the instructor.

## **The Textbook**

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Author: Klaus Jänich

Title: Linear Algebra

Series: Undergraduate Texts in Mathematics

Publisher: Springer-Verlag  
Year: 1994

An electronic copy of the textbook is available at the [UBC Library](#).  
We will follow the textbook closely, and will hopefully cover it completely.  
The homework problems will be taken mostly from this book.

### **Other books:**

Author: Paul R. Halmos  
Title: Finite-Dimensional Vector Spaces  
Series: Undergraduate Texts in Mathematics  
Publisher: Springer-Verlag  
Year: 1974

This is a classic book, which covers the material in much greater depth than is possible in a one-semester course. If you are interested to go further, this book is recommended. The library has an electronic version.

Author: Charles W. Curtis  
Title: Linear Algebra, an introductory approach  
Series: Undergraduate Texts in Mathematics  
Publisher: Springer-Verlag  
Year: 1974

A more elementary book than Halmos, and with more detail than our official textbook. It may be a good supplementary text. The library has an electronic version.

### **Math 223 vs. Math 221**

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Math 223 is the honours version of Math 221. There is a large overlap in material covered in the two courses, but Math 223 is significantly faster, harder and more theoretical. Math 221 teaches you problem solving techniques, Math 223 puts the emphasis on theory, and you will be expected to write formal proofs. In Math 223 we cover additional subjects, and go into more depth than 221. Homework problems in Math 221 are mostly routine, whereas problems in Math 223 will require independent thought and hard work.

If you are interested in an applied subject matter, Math 223 is not for you, you should be taking Math 221.

You can switch down from Math 223 to Math 221 even after the initial 2 weeks add/drop period, although this requires permission of the undergraduate

chair, and is ultimately subject to the Dean's approval. The earlier you switch down to Math 221 the better.

## Marking

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Your mark will be based on homework assignments, two midterm exams and one final exam, weighted as follows:

- Homework: 20%
- Midterm I: 15%
- Midterm II: 15%
- Final Exam: 50%

When calculating your homework score, your two lowest scores will be dropped. No late homework will be accepted.

The performance of this section in Math 221 level problems on the final exam will be used to scale up the marks of the whole section, so that, on average, you will not be penalized for taking the more difficult Math 223, rather than 221. Still, if you are having trouble with Math 223, you should switch down to Math 221 in order to avoid getting lost, in which case the rescaling will not help you.

## Exams

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The midterm exams are scheduled as follows:

- Midterm I: Wednesday, October 10.
- Midterm II: Friday, November 9.

There will be no notes, books, calculators or "cheat sheets" allowed on any of the midterms. This holds also for the final exam.

If you miss one of the midterm exams for medical reasons, you need to promptly inform the instructor, and provide a physician's note specifically stating that you were medically unfit to write the missed exam on that day.

No makeup exams will be given. If you miss a midterm due to a valid emergency, your final exam will count for 65% of your grade.

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