Informatics in the Astronomy Classroom

Illinois Informatics Institute
Student Volunteers

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University of Illinois

Your tour guide
Background
### Why?

When are students going to be trained in the practical issues?

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<td>Stars and Galaxies</td>
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<td>ASTR 122 - H</td>
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<td>ASTR 210</td>
<td>Introduction to Astrophysics</td>
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<td>ASTR 401 - C2</td>
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How?
Who?
Undergraduates

From inverse-square law:  \[ m_1 - m_2 = -2.5 \log \left( \frac{f_1}{f_2} \right) \]

\[ I(r) = I(r_e) e^{-b[(r/r_e)^{1/n} - 1]} \]
From inverse-square law:  \( m_1 - m_2 = -2.5 \log \left( \frac{f_1}{f_2} \right) \)

\[
I(r) = I(r_e) e^{-b[(r/r_e)^{1/n} - 1]}
\]
Undergraduates

\[ n(r, z) = \sum_{i} n_i(0, 0) e^{-r/h_r,i} e^{-z/h_z,i} \]

- \( h_r \) is the scale length
- \( h_z \) is the scale height
\[ n(r, z) = \sum_i n_i(0, 0) e\left(-\frac{r}{h_r,i}\right) e\left(-\frac{z}{h_z,i}\right) \]

*hr* is the scale length

*hz* is the scale height

**Nice formula, but what does this mean?**
Lessons Learned

Data Science skills are not acquired by osmosis!
Vastly different backgrounds, experiences, and interests.
Lessons Learned

Deficiency in basic skills.
The Market

What is Data Science?
The future belongs to the companies and people that turn data into products

Mike Loukides
Round II

Welcome to Practical Informatics for the Physical Sciences!

This course will introduce informatics concepts in a practical manner with an aim towards problems from the physical sciences.

Course Announcements
General Discussion
Syllabus (Incomplete)
CITES Course Wiki

22 August - 28 August

Week One: Introduction to Data Science
#!/usr/bin/env python

def vCircular(distance):
    return sqrt(1.0 - atan(distance)/distance)

def my_plot(x, y):
    ...
    pyplt.savefig("File.pdf")

# General Main method.
if __name__ == '__main__':
    ...
    y = map(vCircular, x)
    my_plot(x, y)
Lessons Learned II
Introduction to Data Science

This course will introduce the basic concepts of working with data, particularly large data for both scientific and commercial applications.
Summary

Informatics Training:

- integrate into curriculum
- new opportunities
- learn from/work with industry

Leverage existing work and knowledge

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Your tour guide

http://lcdm.astro.illinois.edu