Tales from the Trenches:
Incorporating Humanities in STEM disciplines

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Northern Virginia Community College

Bile Production, Taylor Conrad. December 2013, Northern Virginia Community College

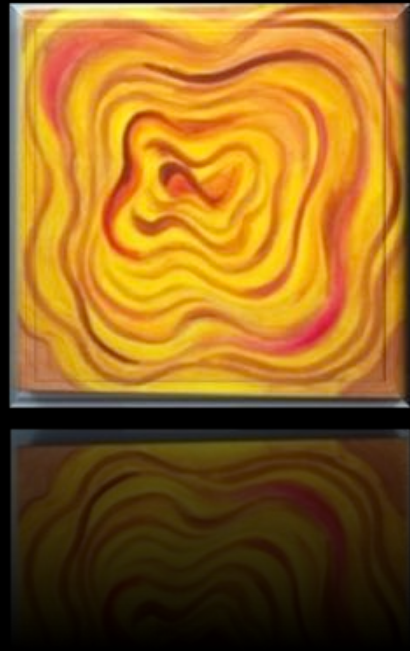
STEAM Objectives

- **Unite the STEM disciplines with artistic expression to creatively express or explore each by locating and focusing on an interface between them**

- **Promote cross-discipline awareness to foster creativity and therefore discover new insights about each component**

AGENDA

STEM + art = STEAM



I. How we Built a “STEaM Engine”
II. The Course Logistics
III. Lessons learned from two separate semesters
IV. Next Steps

Can we integrate Art and Science?

Yes!

- Faculty are looking for opportunities to collaborate!
- Students are looking for cross-disciplinary opportunities

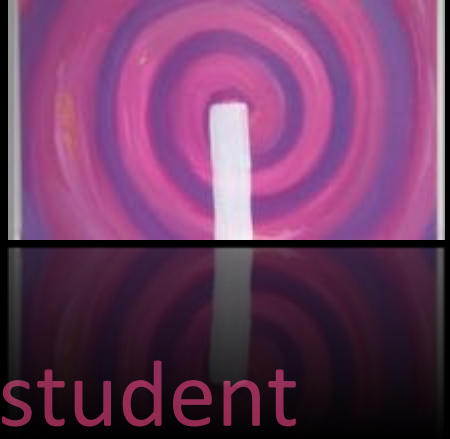
But it's hard to….

- Put a grade on Art (and science!)
- Cross-list one course in many disciplines
- Compensate faculty (time, $$$)

How we Built a "STEaM Engine"

1. Born of a Faculty Learning Community
2. Found $$$ for faculty/course development--VCCS
3. Created an Honors course (299) cross-listed in a number of science and art disciplines
    1. Fall 2013: 8-week, 1 credit
    2. Spring 2015: 16-week, 2 credit
4. Formed Student-Mentor (2) pairings

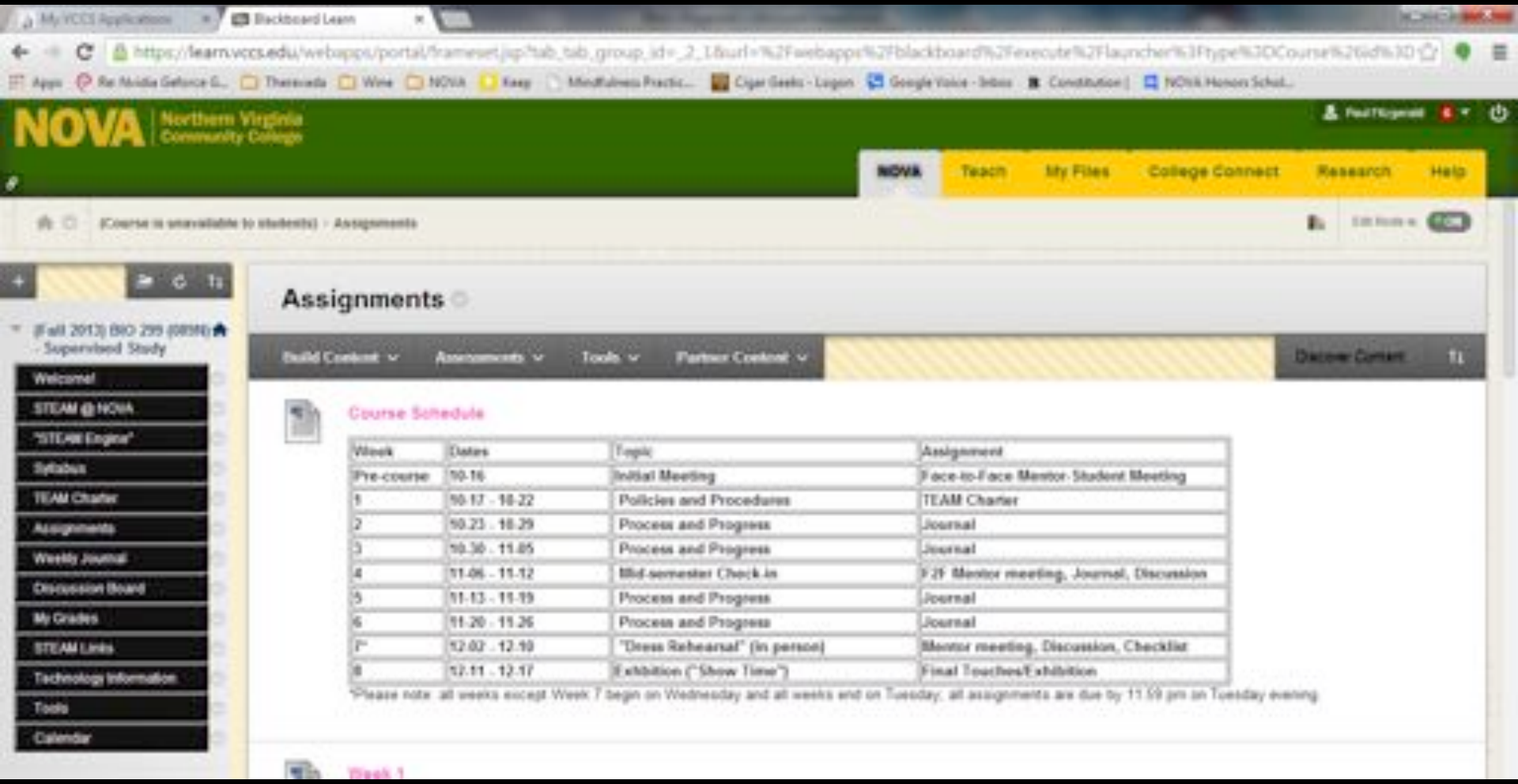
Course Logistics



Link two faculty mentors with one student

- **Mentor from STEM** – Based on student interests
- **Mentor from Art** – Based on specific medium needed
- **Honors Student** – Pool of candidates based on abilities, desire to explore, and willingness to experiment

Create a Syllabus



Determine Faculty/Student Roles

- **Faculty Mentors will…**
  - Provide experience and expertise in their fields
  - Help the student focus on a level that can be completed in the time frame
  - Assign point values for eventual awarding of a letter grade
- **Honors Students will…**
  - be creative and open to possibilities
  - Communicate with faculty members and synthesize their information
  - Document the process throughout the experience
  - Finish on time!

Create communication triangle

Taylor Conrad

Mentorship

Mentorship

Ricky Sears

Paul Fitzgerald

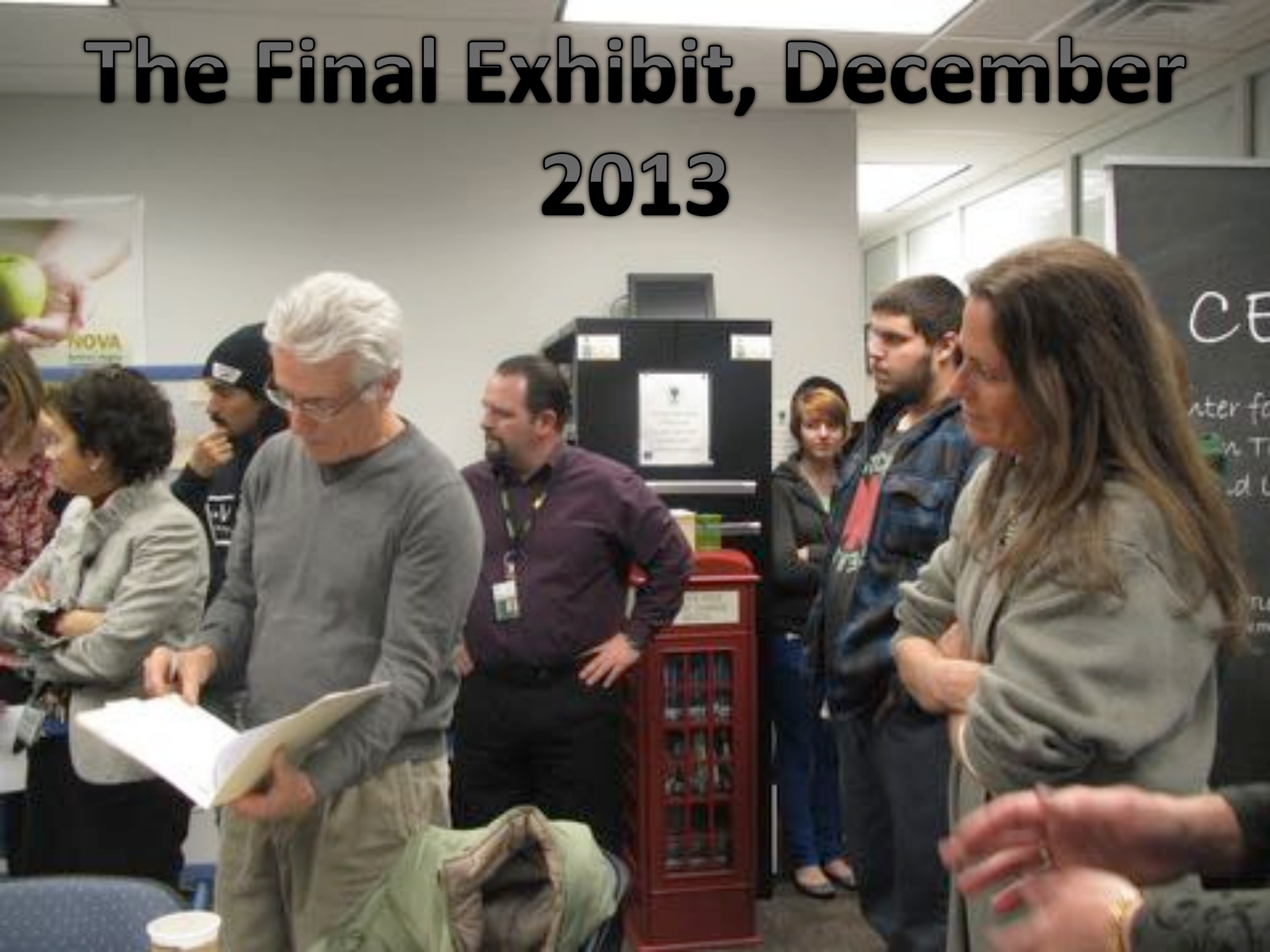
Collaboration

And Let the Students GO!!

Course Evaluation

- **Benchmarked scoring < 50% of grade**
  - Bi-weekly meetings / updates
  - Weekly journals about processes and ideas
  - Mid-term report
- **Final product > 50% of grade**
  - Did the project finish in the time allotted?

The Final Exhibit, December 2013



The Sum of Our Parts

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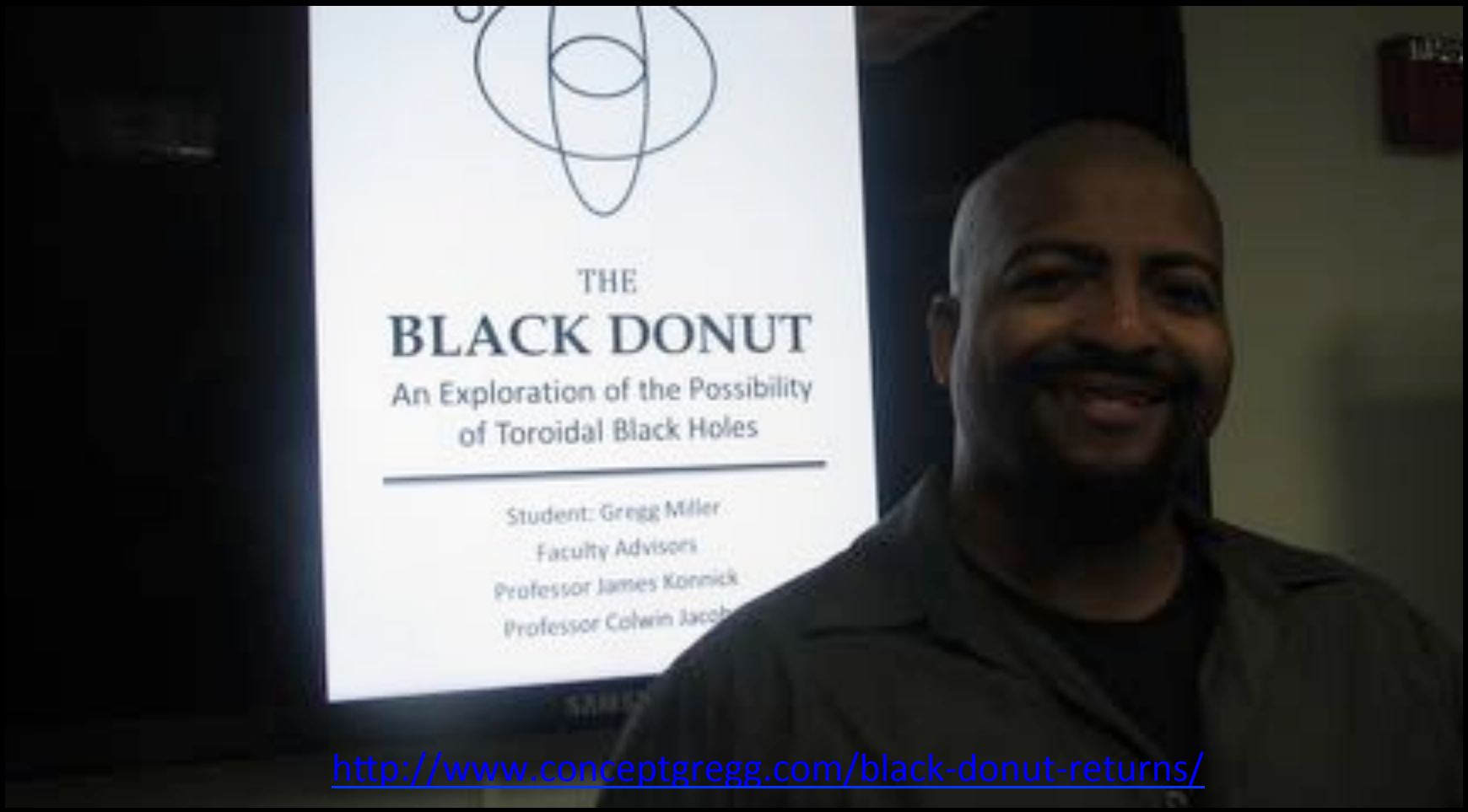
Mentors: Paul Fitzgerald &
Richard (Ricky) Sears

Embryonic Development of Zebrafish (Embryology & Ceramics)

Laurie Campbell

Mentors: Diane Mucci and William (Bill) Schran

The Black Donut (Physics and AutoCAD)



http://www.conceptgregg.com/black-donut-returns/

Gregg Miller Mentors: James Konnick and Colwin Jacobs

Tree of Life (Anatomy of Vision & Art)

Lam Duong

Mentors: Trudy Gillevet and Rebecca Kamen

Course Schedule/Grading Schema

Week	Dates	Assignment	Points
Pre-course	10-16	Initial Meeting	
1	10-17 - 10-22	Team Charter	50
2	10-23 - 10-29	Journal	10
3	10-30 - 11-05	Journal	10
4	11-06 - 11-12	Discussion, Journal	30
5	11-13 - 11-19	Journal	10
6	11-20 - 11-26	Journal	10
7	12-02 - 12-10	Discussion, Meeting Schedule, Checklist	30
8	12-11 - 12-17	Final Touches/Exhibition	250
		Total Points	400

[redacted]

Points	Grade
360-400	A
320-359	B
280-319	C
240-279	D
< 240	F

Lessons Learned
Fall 2013

Fall 2013:

- 8 weeks is too short
  - The creative process takes time
  - Once decided, the artistic composition takes time
    - Paint drying, firing clay, writing code
- Need better venue for Exhibit
- Need more Art and Science mentors (pool?)
- How shall faculty be compensated?
- Mentor training needed: All members must understand their role, and the expectations of the project.
- More consistent student-faculty check-ins needed

More Lessons Learned

- Recruiting faculty and students is challenging
- Institutional buy-in is critical
- Cross-discipline course listing is critical – and difficult
- Funding Stream necessary
  - STEAM materials for students
  - Conference funding (conference falls inbetween the two fiscal years)

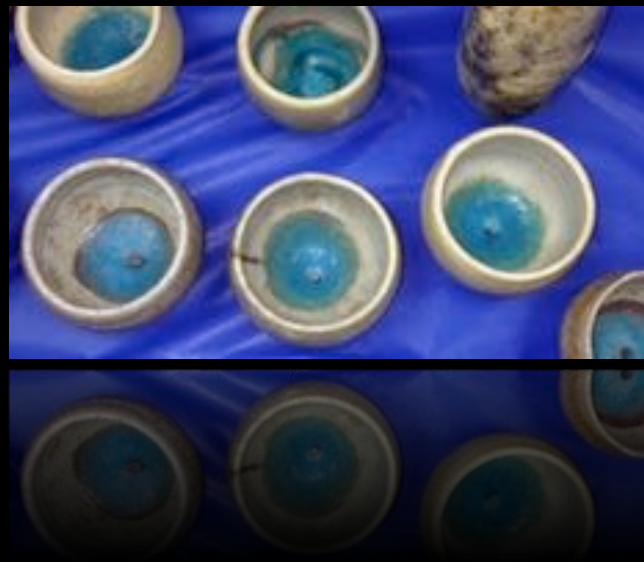
Spring 2015: Changes

- Expanded 2-cr, 16-week course format
- Funded Student Supplies/Materials (SENCER SSI 2014 grant)
- Recruited more art mentors and new science mentors
- Provided mentor training
- Established regular round table discussions with all Students and mentors to assess progress and troubleshoot
- Reserved larger, more formal venue

Illustrating Pathway of Light

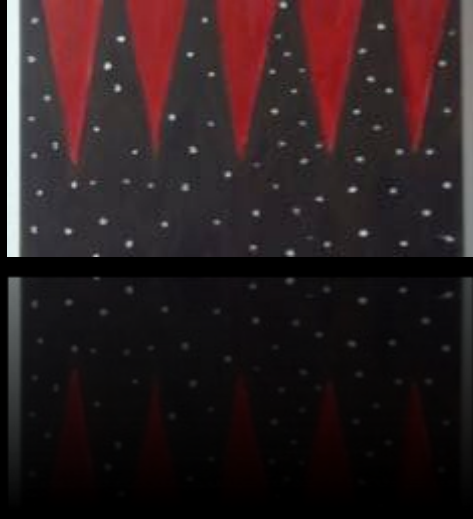
The Final Exhibit, May 2015

Next Steps



- Build critical institutional buy-in
  - Funding
  - Mentor compensation
  - Art Storage
- Build cadre of art/science mentors, grow from grassroots
- Improve communication (through blogs, bb, newsletter, press releases)
- Maintain contact/relationships with registrars, Deans, Assistant Deans

Resources



- STEM to STEAM http://stemtosteam.org/
- GMU http://theater.gmu.edu/affiliates/steam.html
- National Service-Learning Clearinghouse www.servicelearning.org
- Corporation for National & Community Service www.nationalservice.gov

Acknowledgements

- Paul Fitzgerald (Honors Chair, Annandale Campus) pfitzgerald@nvcc.edu
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- VCCS Professional Development Grant #: F2013-607PF
- Rebecca Kamen http://rebeccakamen.com/#2

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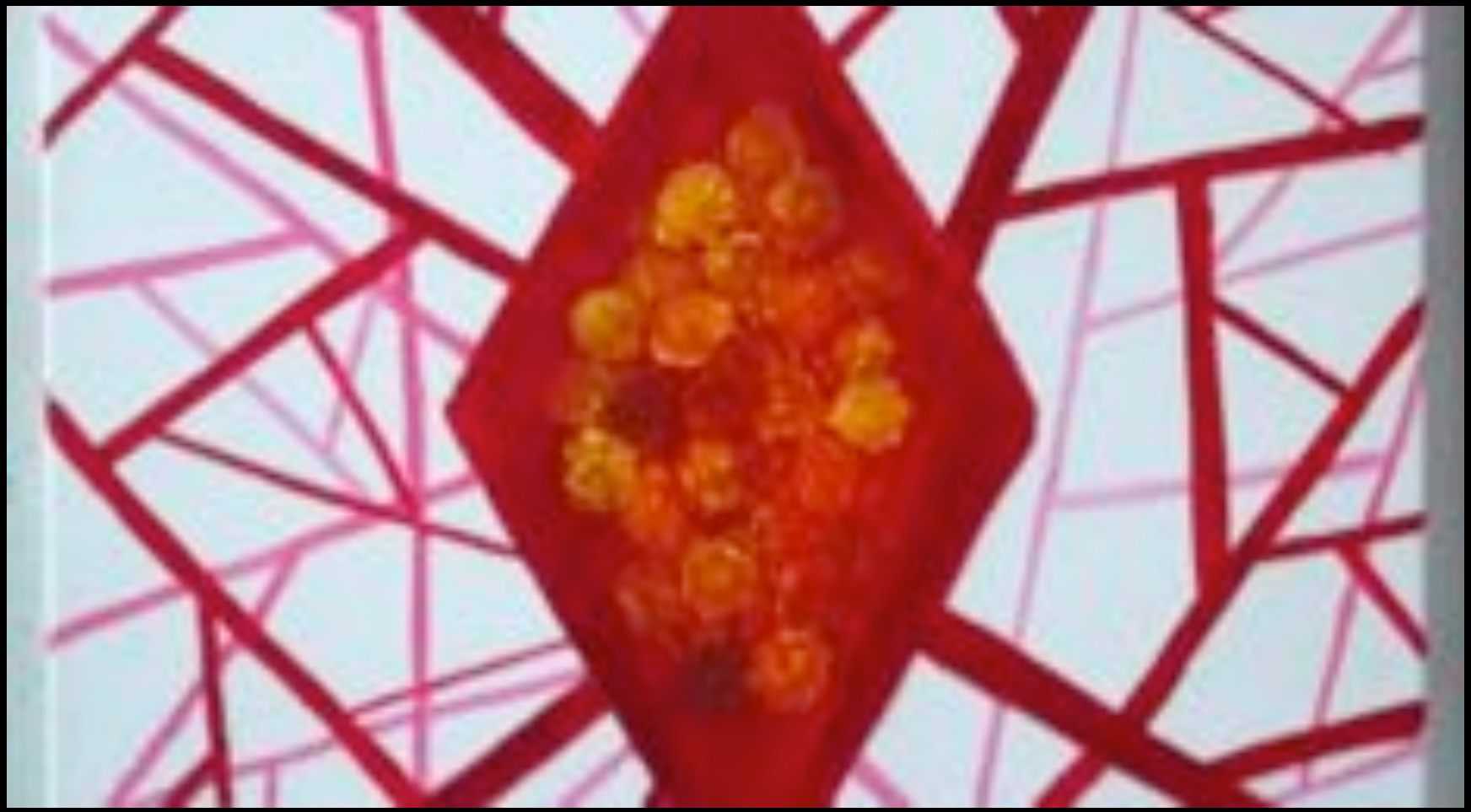

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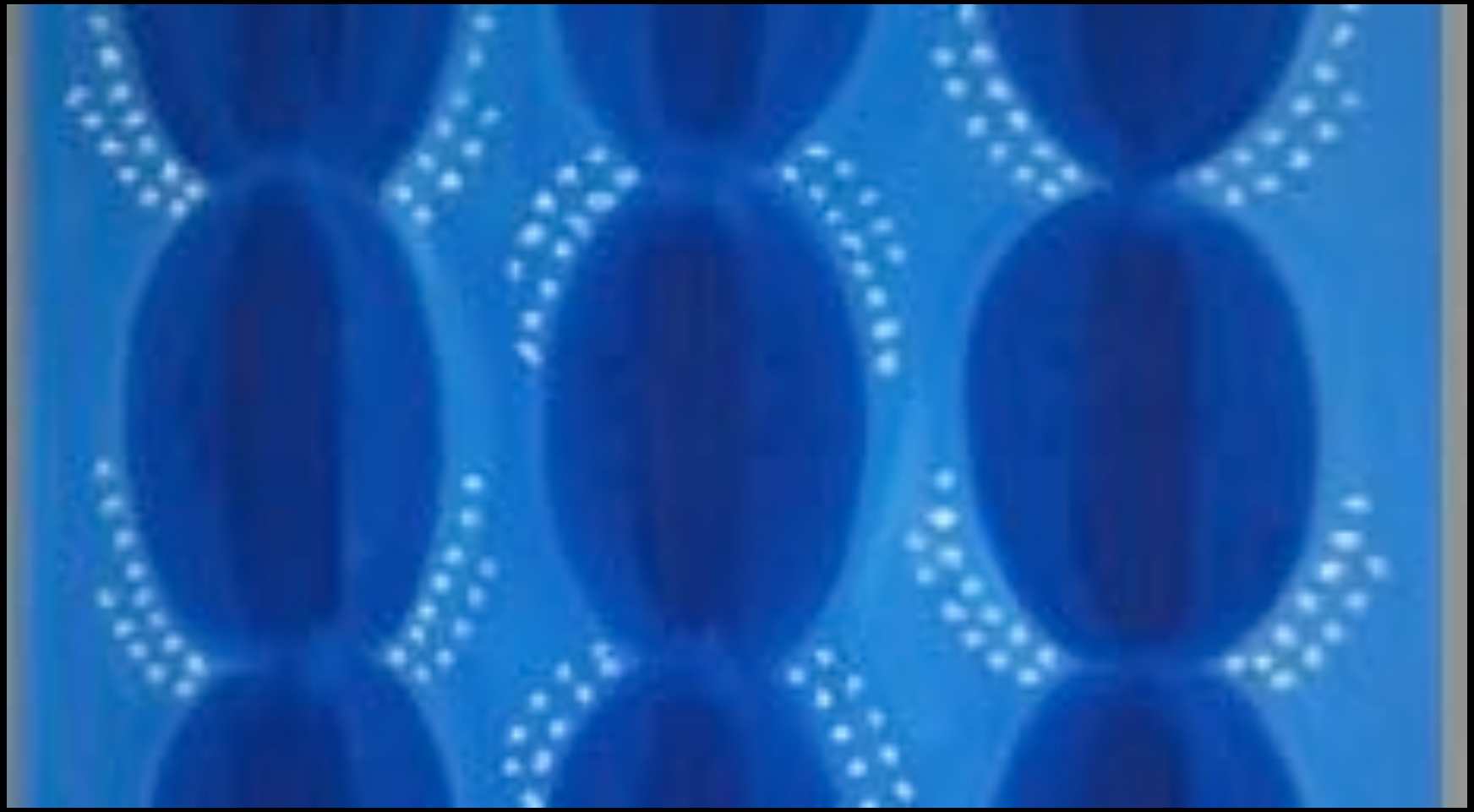

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