2020 Collegeville Workshop on Scientific Software

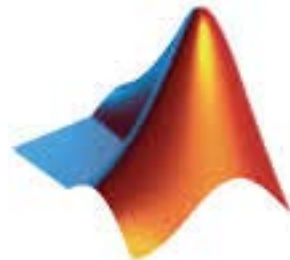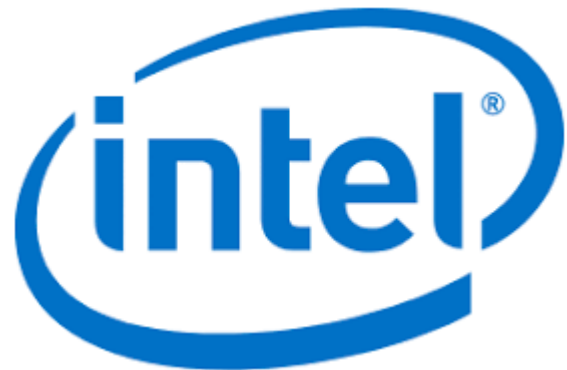Developer Productivity
July 21 - 23, 2020

Thanks to Our Sponsors

- Intel Corporation and The Mathworks, Inc.
  - Support to fund student staff
- College of Saint Benedict & Saint John's University
  - Home institution, host of Zoom resources
- Thank you!

Meeting Purpose

- Explore commonalities, differences, complementarities, workforces of
  - Academia
  - Industry
  - Labs
- Build knowledge and awareness to improve productivity
- Main purpose: Build community

Workshop Agenda

- All live sessions use Zoom
  - Panel: Single session
  - Discussion: Single session with random breakout assignments
  - TeaTime/Poster: Separate session for each
- Key Document: "Collegeville 2020 Main Page"
  - Google Doc
  - https://tinyurl.com/Collegeville2020
  - Single page to find out what is happening

Agenda

Time (US CDT)	July 21 Get Details	July 22 Get Details	July 23 Get Details
9:45 am	Opening Remarks (Add to calendar)		
10:00 am	Panel 1: Productivity Definitions & Challenges (Add to calendar)	Panel 2: Technical Approaches to Improved Productivity (Add to calendar)	Panel 3: Cultural Approaches to Improved Productivity (Add to calendar)
11:30 am	Break & Slack Discussions	Break & Slack Discussions	Break & Slack Discussions
12:30 pm	Discussion 1: Productivity Definitions & Challenges (Add to calendar)	Discussion 2: Technical Approaches to Improved Productivity (Add to calendar)	Discussion 3: Cultural Approaches to Improved Productivity (Add to calendar)
2:00 pm	Break & Slack Discussions	Break & Slack Discussions	Break & Slack Discussions
3:00 pm	TeaTime/Posters 1: Productivity Definitions & Challenges (Add to calendar)	TeaTime/Posters 2: Technical Approaches to Improved Productivity (Add to calendar)	TeaTime/Posters 3: Cultural Approaches to Improved Productivity (Add to calendar)
4:30 pm			Closing Remarks (Add to calendar)

Whitepapers & Recorded Content

- 29 videos on Collegeville YouTube Channel
  - 9 interviews with a variety of community members
  - 10 group discussion on productivity themes
  - 10 presentations from whitepapers

- 33 whitepapers on website
- Most have related video content

Make use of this content during and after the workshop

Use of Slack during meeting

- We encourage Slack chat during the meeting at any time
  - Especially during panels and breaks
  - To keep discussion organized around themes there is a special channel for each day (day-one-chat, day-two-chat, day-three-chat)
- Keep Zoom panel chat reserved for Q&A

Panel 3: Cultural Approaches to Improved Productivity

- Panelists:
  - Sandra Gesing, University of Notre Dame
  - Jan-Patrick Lehr, Technische Universität Darmstadt
  - Reed Milewicz, Sandia National Laboratories
  - Vanessa Sochat, Stanford University
  - Mary Ann Leung, Sustainable Horizons Institute
  - Mark Miller, Lawrence Livermore National Laboratory
- Moderator: Lois Curfman McInnes, Argonne National Laboratory

Sandra Gesing Opening Remarks: Cultural improvement approaches

- One or two high impact cultural approaches to improve productivity
  - Well-defined roles in developer teams
  - Well-defined processes

- Key roles in defining and implementing the above approaches
  - Team leaders, developers, computational scientists, facilitators
- Potential impact if approaches are successful
  - Managed expectations
  - Choice of focus of work on technical as well as on domain side
  => Happy developers;-)
- Existing "bright spots" or other signs of progress
  - Upcoming RSE teams and RSE associations, spread of word of success stories
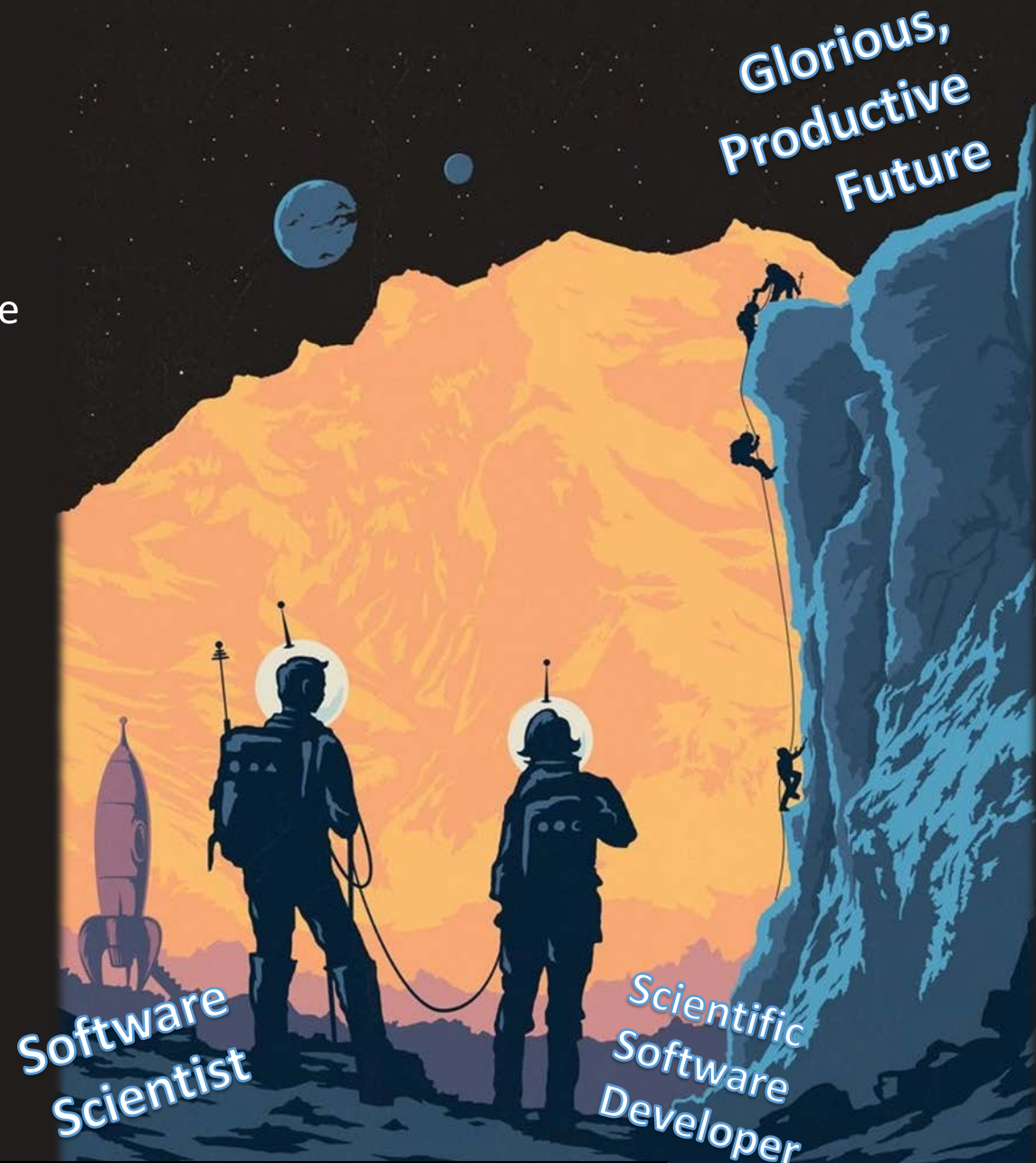 - Existing project management frameworks such as SCRUM and further developments of agile development

2020 Collegeville Workshop on Scientific Software: Panel on cultural approaches to improve productivity

JP Lehr Opening Remarks: Cultural improvement approaches

1) Include productivity concerns and technological solutions more actively into (academic) teaching to better prepare (under-grad/phd) students

- Communication, technological, positivity, writing, …
- Include (under-grad) students as full-project members: discussion, peer-review, documentation, design, writing papers, …

2) Acknowledge the complexity of software development, the software stack, the system stack, etc.

- Simply run these benchmarks, or make something faster
- **Key roles** 1. "everybody", 2. management / supervisor (Prof, PostDoc, PhD)
- **Bright Spots** Conferences promote/request artifacts and reproducibility

Reed Milewicz: Opening Remarks

- **Approach**: Increase engagement with the software engineering research (software science) community

- **Roles**

  - **Software scientists:** We need to establish closer ties with software scientists in academia, and we need to create more roles for them in our institutions

  - **Scientific software developers:** We need to publicize our challenges and make them attractive to the software engineering community

- **Potential Impact**

  - Software engineering tools and processes that were built with our needs in mind

  - Pipelines for software-focused professionals

- **Signs of Progress**

  - Software engineering line organizations like Software Engineering and Research at Sandia and Research Software Engineering at Oak Ridge

  - In academia, the Software Engineering for Science group at the University of Alabama

Glorious, Productive Future

Software Scientist

Scientific Software Developer

2020 Collegeville Workshop on Scientific Software: Panel on cultural approaches to improve productivity

Vanessa Sochat Opening Remarks: Cultural improvement approaches

Developer productivity comes down to developer happiness!

- Physical and mental well-being
- Self-compassion
- Practicing empathetic review

Each of us is empowered to make positive changes.

- Take responsibility for your goals, routine,
  and communication channels

Note from Lois: See Vanessa's podcast series:
RSE Stories:
https://bssw.io/blog_posts/research-software-engineer-stories

Mary Ann Leung Opening Remarks: Broadening Participation

SUSTAINABLE HORIZONS INSTITUTE

- Why broadening participation to improve developer productivity?
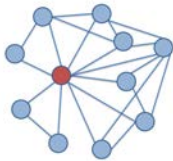
Future Workforce Needs
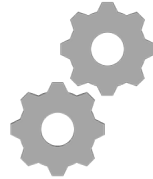
CSE complex, teamwork, creativity, collaboration

Research → Diverse teams are more innovative

- High impact cultural approaches:

expand networks

cultivate inclusion

address critical mass

balance critical mass & integration

- Potential impacts if successful: innovation, sustainability
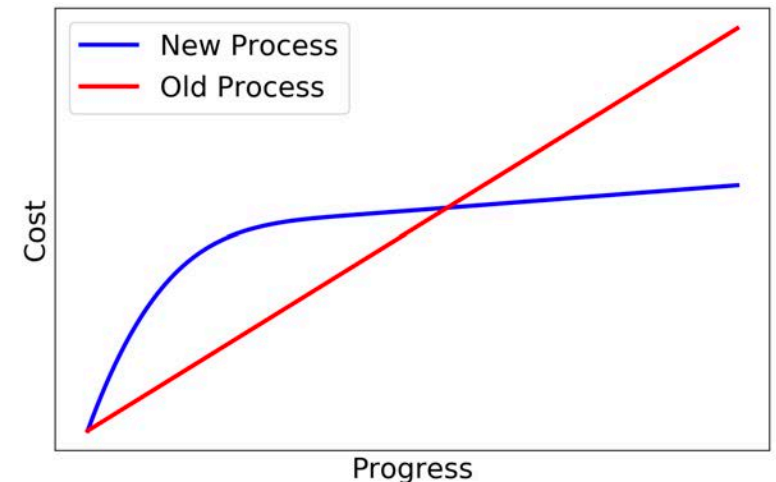
innovation

sustainability

- Examples: Sustainable Research Pathways, Broader Engagement @SIAM-CSE

2020 Collegeville Workshop on Scientific Software: Panel on cultural approaches to improve productivity

Mark Miller Opening Remarks: Cultural improvement approaches

- Individual recognition of....
    - Equality != Inclusion (Equality < Inclusion)
    - Good/decent people can still be deeply biased
    - Anisotropy in dimensions of bias & inclusion
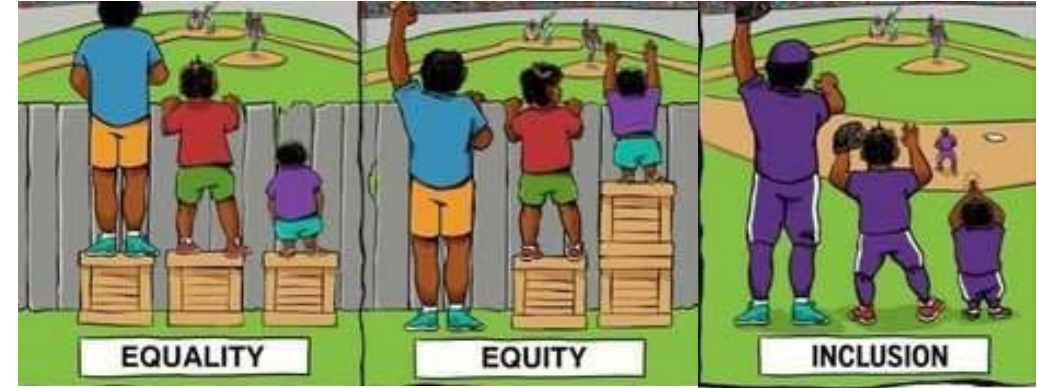
- More faith in organic, grass-roots, bottom up approaches than top-down
    - Individual + first tier management (w/support from top)
- Benefits of inclusion known but there are costs
- We do inclusion great for process/product
- People willing to talk about it **now** more than they ever have

2020 Collegeville Workshop on Scientific Software: Panel on cultural approaches to improve productivity

Q&A Protocol

- Use Zoom chat to type your question (brief form)
- When your question is mentioned, unmute to ask verbally
- Unless asked to speak, please keep muted
- For general chat about panel, use Slack #day-three-chat
- Panel ends at 11:30 am CT or when no more questions
- Stopping screen sharing now so we can see faces ☺
- Will start up to give instructions for Discussions

Workshop Zoom Group Photo Time

Everyone who'd like to participate:

Please turn on your camera and smile ☺

Discussions, Posters, Teatimes Instructions

- Please sign in to next Zoom session promptly at 12:30 pm US CDT
- At 12:35 pm, we will use Zoom breakout rooms with automatic random assignments to form discussion groups of 6 – 8 people
- Discussions are scheduled from 12:30 – 2:00 pm CDT
- Posters and Teatime theme discussions start at 3:00 pm CDT
  - There are two posters and four teatime themes today
  - Each discussion has its own unique Zoom link (see Main Page for details)
  - Please visit any and all of them as you have time and interest
- We will gather as one group for Closing Remarks at 4:30 pm CDT
- Questions?

2021 Collegeville Workshop on Scientific Software:
Software Sustainability   July 20-22, 2021

https://collegeville.github.io/CW21/

- Register by joining Collegeville 2021 Slack workspace
  - https://collegeville.github.io/CW20/Registration2021.html