



## Colorado State University, June 3-9, 2018

**Registration (5:30 – 6:30 PM)      Room 304-306 Lory Center**

June 3, 2018

**Welcome and Opening Reception (6:30-9:30 PM)**

June 3, 2018

Longs Peak Room, Lory Center

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<b>6:30-6:45</b>	<b>Welcome and Opening Remarks</b>  Jill Pecon Slattery and Sue Vandewoude
<b>6:45-7:00</b>	<b>Introduction of the ‘Best Practices’ workflow group exercise.</b>  Bob Fitak
<b>7:00-7:45</b>	<b>10 Attendee Presentations</b> <b>Attendees</b>
<b>6:30-9:30</b>	<b>Refreshments and Social Time</b>

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# Day 1: Command Line, NGS Data Overview, Genome Mining

June 4, 2018

Lory Center Room 304-306

<b>7:00 – 8:00</b>	<b>Breakfast</b>	Rams Horn Dining Center
<b>8:15-8:25</b>	<b>Step 1: What are my NGS tools for wildlife disease research? Assignment: Workflow Projects</b>  Jill Pecon-Slattery	
<b>8:25-8:35</b>	<b>Introduction to computers</b>  Joe Strecker	
<b>8:35-9:30</b>	<b>Intro to genomics and NGS</b>  Mark Stenglein	
<b>9:30-10:00</b>	<b>CSU Flash Talk Christie Mayo</b>	
<b>10:00-10:20</b>	<b>Coffee Break and Meet Invited Speaker</b>	
<b>10:20-12:15</b>	<b>Command Line and BLAST</b>  Bob Fitak and Mark Stenglein	
<b>12:15-1:15</b>	<b>Lunch Provided Onsite</b>	
<b>1:15-2:15</b>	<b>10 Attendee Presentations</b>	
<b>2:15 -3:15</b>	<b>BLAST exercises</b>  Bob Fitak and Mark Stenglein	
<b>3:15-3:35</b>	<b>Coffee Break</b>	
<b>3:35-5:00</b>	<b>Exercises in Hypothesis Driven Genome Mining of Databases: What do I want to know? Data quality control (lecture; Bob) and beginning of downloading and data processing exercise</b>  Mark Stenglein and Bob Fitak	
<b>5:00-7:00</b>	<b>FREE TIME AND DINNER</b>	Rams Horn Dining

**7:30-8:30**

**Plenary Speaker**

Longs Peak Room

Tracey Goldstein  
University of California-Davis

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**8:30-9:30**

**Social Hour with Invited Speaker**

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## Day 2: Genome Assembly, Whole Genome Alignments, Metagenomics

June 5, 2018

Lory Center Room 304-306

<b>7:00 – 8:00</b>	<b>Breakfast</b>	Rams Horn Dining Center
<b>8:15-8:25</b>	<b>Step 2: Best Practices for Generating Quality Genomes of Host and Pathogen</b>	
<b>8:25-9:30</b>	<b>Mapping to Reference Genome: Good, Bad Ugly</b>  Mark Stenglein and Bob Fitak	
<b>9:30-10:00</b>	<b>Jeff Foster</b>  White Nose and bats	
<b>10:00-10:20</b>	<b>Coffee Break and Meet Invited Speaker</b>	
<b>10:20-11:15</b>	<b>Mapping Exercises</b>  Bob Fitak and Mark Stenglein	
<b>11:15-12:15</b>	<b>Genome Assembly lecture</b>  Mark Stenglein	
<b>12:15-1:15</b>	Lunch Provided Onsite	
<b>1:15-3:15</b>	<b>Genome assembly exercises</b>  Mark Stenglein and Bob Fitak	
<b>3:15-3:35</b>	Coffee Break	
<b>3:35-4:35</b>	<b>Genome assembly exercises continued and introduction to metagenomics and disease lecture</b>  Mark Stenglein and Bob Fitak	
<b>4:35-5:00</b>	<b>Thought Exercise and Best Practices Session #1)</b>  Jill, Bob, Chris, Mark will be on hand to help as	

	participants work on their scenario	
<b>5:00-7:00</b>	FREE TIME AND DINNER	Rams Horn Dining Center
<b>7:30-8:30</b>	<b>Plenary Speaker</b> Jeff Foster Northern Arizona University	Longs Peak Room
<b>8:30-9:30</b>	Social Hour with Invited Speaker	

## Day 3: Multiple Sequence Alignments and Phylogenomics

June 6, 2018

Lory Center Room 304-306

<b>7:00 – 8:00</b>	<b>Breakfast</b>	Rams Horn Dining Center
<b>8:15-8:25</b>	<b>Step 3: Comparing Differences Within and Between Genomes</b> Jill Pecon Slattery	
<b>8:25-9:00</b>	<b>Introduction to Multiple Sequence Alignments of Targeted &amp; Whole Genomes</b> Jill Pecon Slattery	
<b>9:00-9:30</b>	<b>Alignment Computer Lab: Part 1</b> <b>Nectin4, Aliview, Seaview, mafft, Muscle, clustalomega</b> Jill Pecon Slattery and Justin Lee	
<b>9:30-10:00</b>	<b>CSU Flash Talk</b> Rebekah Kading	
<b>10:00-10:20</b>	<b>Coffee Break and Meet Invited Speaker</b>	
<b>10:20-10:50</b>	<b>Alignment computer lab: Part 2</b> <b>Nectin4, Aliview, seaview, mafft, muscle, clustalomega, PRANK</b> Jill Pecon Slattery and Justin Lee	
<b>10:50-11:55</b>	<b>Phylogenomic Trees: Models, Algorithms, Accuracy, Robustness, Measures of Support and Interpretation</b> Jill Pecon Slattery	
<b>11:55-12:15</b>	<b>Bayesian Methods Overview</b> Bob Fitek	
<b>12:15-1:15</b>	Lunch Provided Onsite	
<b>1:15-3:15</b>	<b>Phylogenomic Reconstruction Lab: jModeltest PAUP, MEGA, ML ME MP</b>	

	Jill Pecon Slattery*, Justin Lee	
<b>3:15-3:25</b>	Shortened Coffee Break	
<b>3:25-3:50</b>	<b>Phylogenomic Reconstruction Lab: MrBayes</b> Justin Lee*	
<b>3:50-5:00</b>	Field Trip to CSU Veterinary Hospital	
<b>5:30-7:00</b>	FREE TIME AND DINNER	Rams Horn Dining Center
<b>7:30-8:30</b>	<b>Optional computer time with Instructors</b>	

## Day 4: Population Genomics

June 7, 2018

Lory Center Room 304-306

7:00 – 8:00	Breakfast	Rams Horn Dining Center
8:15-8:25	<b>Step 4: Applying my genomic tools across populations within host &amp; pathogen</b> Jill Pecon Slattery	
8:25-9:30	<b>Population Genomics 101</b> Chris Funk	
9:30-10:00	<b>CSU Flash Talk</b> Sue VandeWoude	
10:00-10:20	<b>Coffee Break and Meet Invited Speaker</b>	
10:20-11:00	<b>Population Genomics 101 (cont)</b> Chris Funk	
11:00-11:30	<b>Host Population Genomics in Disease: Landscape Genomics</b> Daryl Trumbo	
11:40-12:15	<b>Computer Lab: Population Genomics</b> Chris Funk & Daryl Trumbo	
12:15-1:15	Lunch Provided Onsite	
1:15-3:15	<b>Computer Lab: Population Genomics</b> Chris Funk & Daryl Trumbo	
3:15-3:35	Coffee Break	
3:35-4:00	<b>Computer Lab: Population Genomics</b> Chris Funk & Daryl Trumbo	
4:00-5:30	<b>Trip to NGS Sequencing Center</b>	
5:30-7:00	FREE TIME AND DINNER	Rams Horn Dining Center



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**7:30-8:30**

**Optional Computer Time with Instructor**

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## Day 5: Clocks, Signals of Selection and Adaptation, Variant Function

June 8, 2017

Lory Center Room 304-306

7:00 – 8:00	Breakfast	Rams Horn Dining Center
8:15-8:25	Step 5: Functional Signals of Host-Pathogen Interactions from Population & Comparative Genomics	
8:35-9:30	Intra-Host Pools Pathogen Mark Stenglein	
9:30-10:00	CSU Flash Talk Greg Ebel	
10:00-10:20	Coffee Break and Meet Invited Speaker	
10:20-10:40	Molecular Clocks, Gene Trees, Species Trees, Bayesian (host & pathogen) Jill Pecon Slattery	
10:40-11:15	Variants, Selection, Adaptation, Fitness, Disease (host & pathogen) Jill Pecon Slattery	
11:15-11:45	Thought Exercise and Best Practices Session #2) Jill, Bob, Chris, Mark will be on hand to help as participants work on their scenario	
11:45-12:15	Computer Lab: Host gene alignment, phylogeny, variant identification Jill Pecon Slattery	
12:15-1:15	Lunch Provided Onsite	
1:15-2:45	PAML Computer Lab (host and/or pathogen) Jill Pecon Slattery* and Justin lee	
2:45-3:15	BEAST and Associated Software Overview Justin Lee*	

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<b>3:15-3:35</b>	Coffee Break
<b>3:35-5:00</b>	<b>BEAST Lab (Host and/or Pathogen)</b> Justin Lee*
<b>6:00-?</b>	Party Downtown Fort Collins

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## DAY 6: Putting it all together: your workflow presentations

June 9, 2017

Lory Rm 304-306

7:00-8:15	Breakfast	Rams Horn Dining
8:15-8:20	Step 6: Our Workflow & GDW2018 Publication Jill, Bob, Sue, Chris, Mark	
8:20-9:00	Scenario Workflow #1: Group 1	
9:00-9:40	Scenario Workflow #2: Group 2	
9:40-10:00	Coffee Break	
10:00-10:40	Scenario Workflow #3: Group 3	
10:40-11:20	Scenario Workflow #4: Group 4	
11:20-11:40	Concluding Remarks & Farewells All instructors & participants	