

## Field Phenomics Workshop: 7 to 10 April, 2014

	Lecturer	Topic
<b>Mon</b>		Workshop Welcome and Sensor Basics
<b>07:30</b>		<b><i>Van departs from hotel area</i></b>
08:15		Arrive at MAC, receive course material
08:30	Jeff Silvertooth (UA)/J Poland/J White	Welcome, overview, participant introductions
09:00	J Poland	Introduction to Field-Based High Throughput Phenotyping
09:20	J Poland/K Thorp	Experimental design and field layout planning for phenomics
09:40	A French	Sensors 1: Thermal infrared
10:10		<i>Break</i>
10:30	J White	Sensors 2: Ultrasonic proximity sensors
11:00	M Conley/J White/A French	Exercise A (field): Infrared thermometry & ultrasonic proximity
12:20		Return to MAC
12:30		<i>Lunch</i>
13:30	MC, JW, AF	Q&A for field exercise A
13:40	K Thorp	Sensors 3: Introduction to spectral reflectance (passive sensors)
14:10	P Andrade	Sensors 4: Introduction to spectral reflectance (active sensors)
14:30	K Thorp/P Andrade	Exercise B (demo): Reflectance sensors
15:00		<i>Break during exercise</i>
15:20	P Andrade/K Thorp	Exercise C (lab): Analysis and comparisons of reflectance data
16:45	PA, KT	Q&A for field exercises B & C
17:00		End of Monday's activities
<b>17:15</b>		<b><i>Transport back to hotel area</i></b>
<b>Tues</b>		Vehicles and Sensor Integration
<b>07:30</b>		<b><i>Van departs from hotel area</i></b>
08:15	J White/J Poland	Recap of previous day and logistics
08:30	J White/J Poland/P Andrade	Vehicle options: carts, tractors, gantry cranes, UAVs and more
09:00	P Andrade	GPS basics
09:40	R Strand	Sensor electronics: power, grounding, signal types, etc.
10:00		<i>Break</i>
10:20	P Andrade	Sensor deployment: height, field of view, refresh rates, etc.
10:40	P Andrade/J White	Exercise D (lab & field): Sensor position (height, FOV, view angle)
12:30		<i>Lunch</i>
13:30	K Wang/M Conley	Data logging basics and Campbell loggers
14:00	R Strand	LabView and National Instruments options
14:15	KW, MC, RS	Lab exercise E1 <sup>1</sup> : Operation of Campbell CR-3000s
14:15	JP, JW, AF, KT	Lab exercise E2: (to be determined based on interests)
15:00		<i>Break, then continue lab exercises</i>
16:45	(various)	Review of exercises D & E
17:00		End of Tuesday's activities
<b>17:15</b>		<b><i>Transport back to hotel area</i></b>
<b>Wed</b>		Data Processing and Analysis
<b>07:30</b>		<b><i>Van departs from hotel area</i></b>

08:15	J White/J Poland	Recap of previous day and logistics
08:30	K Thorp	Georeferencing: geoprocessing within a GIS
09:00	K Wang	Georeferencing: post-processing sensor outputs
09:20	K Thorp/K Wang	Exercise F (lab): Georeferencing sensor outputs
10:00		<i>Break</i>
10:15		(continue Exercise F)
11:15	J White/J Poland	The data analysis challenge: from raw data to phenotypes
12:00		<i>Lunch</i>
13:00	J White	Data analysis: responses at weekly time scales
13:30	A French	Data analysis: diurnal responses
13:50	K Thorp/S Welch	Inverse modeling
14:30	JW, AF, KT, SW	Exercise G (lab): Analyzing time series—weekly and daily data
15:00		<i>Break</i>
15:15		(continue Exercise G)
16:00	R Walls	iPlant Cyberinfrastructure and Phenomics
16:45		Recap of workshop activities
17:00		End of Wednesday's activities
17:30		Evening picnic and social (Chandler)
<b>19:30</b>		<b><i>Transport back to hotel area</i></b>
<b>Thurs</b>		<b>Data Management and Workshop Review</b>
<b>07:30</b>		<b><i>Van departs from hotel area</i></b>
08:15	J White/J Poland	Recap of previous day and logistics
08:30	J White	Metadata for describing field experiments and phenotyping
09:00	J Poland/K Wang	Overview of work flow
09:20	K Wang	Data management: from georeferencing to data storage and access
09:40	K Thorp/K Wang	Participants discuss potential approaches and tools for data management
10:10		<i>Break</i>
10:30	S Welch/Nan An/J White	Imaging and image analysis: the next frontier
11:15	(all)	Organize small group or one-on-one meetings
11:30	J Poland/J White	Course evaluation. Begin small group or one-on-one meetings
12:00		<i>Lunch</i>
13:00	(all)	Continue small group or one-on-one meetings
15:00		<i>Break</i>
15:20	S Welch/E Reidel/J Poland	Round-table: Second and third generation field phenomics
16:30	J Poland/J White	Closing remarks and comments on course evaluations
17:00		Course closes
<b>17:15</b>		<b><i>Transport back to hotel area</i></b>

<sup>1</sup> Participants who are already familiar with data loggers or who have access to data logging expertise will be polled for other exercises or discussion options.