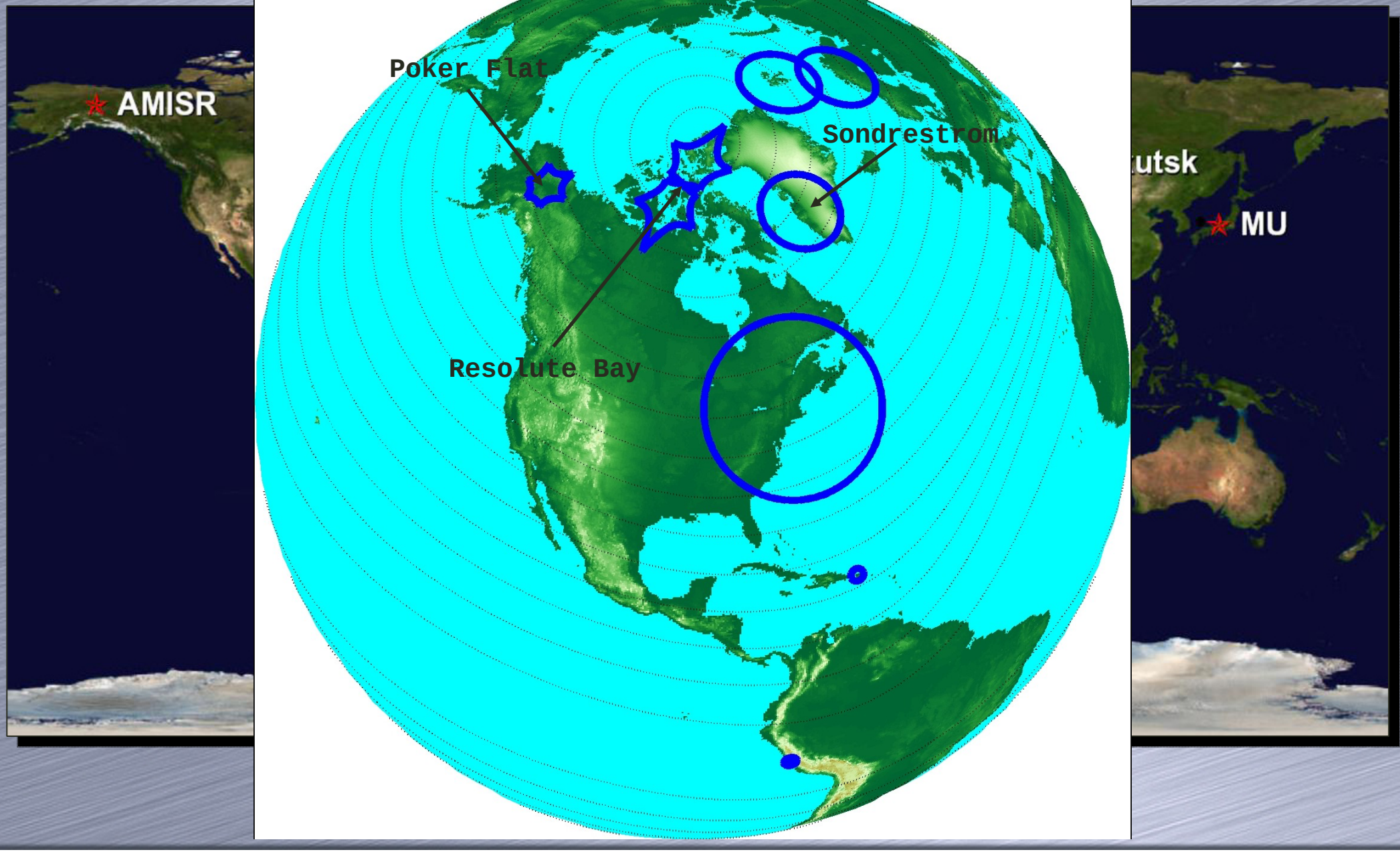
Sondrestrom and AMISR Facilities

John Kelly
Craig Heinselman
SRI International

ISR Facilities



Sondrestrom Facility

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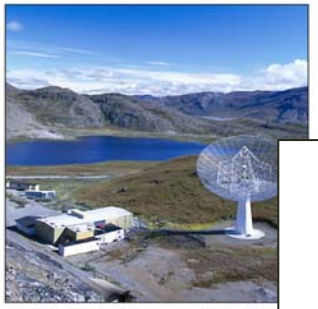
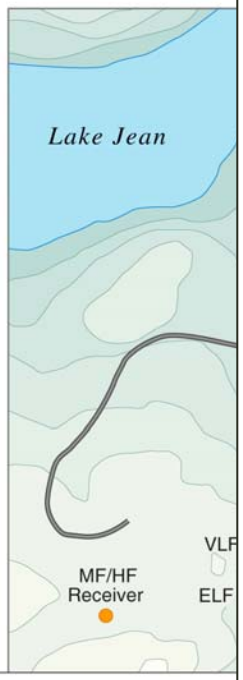
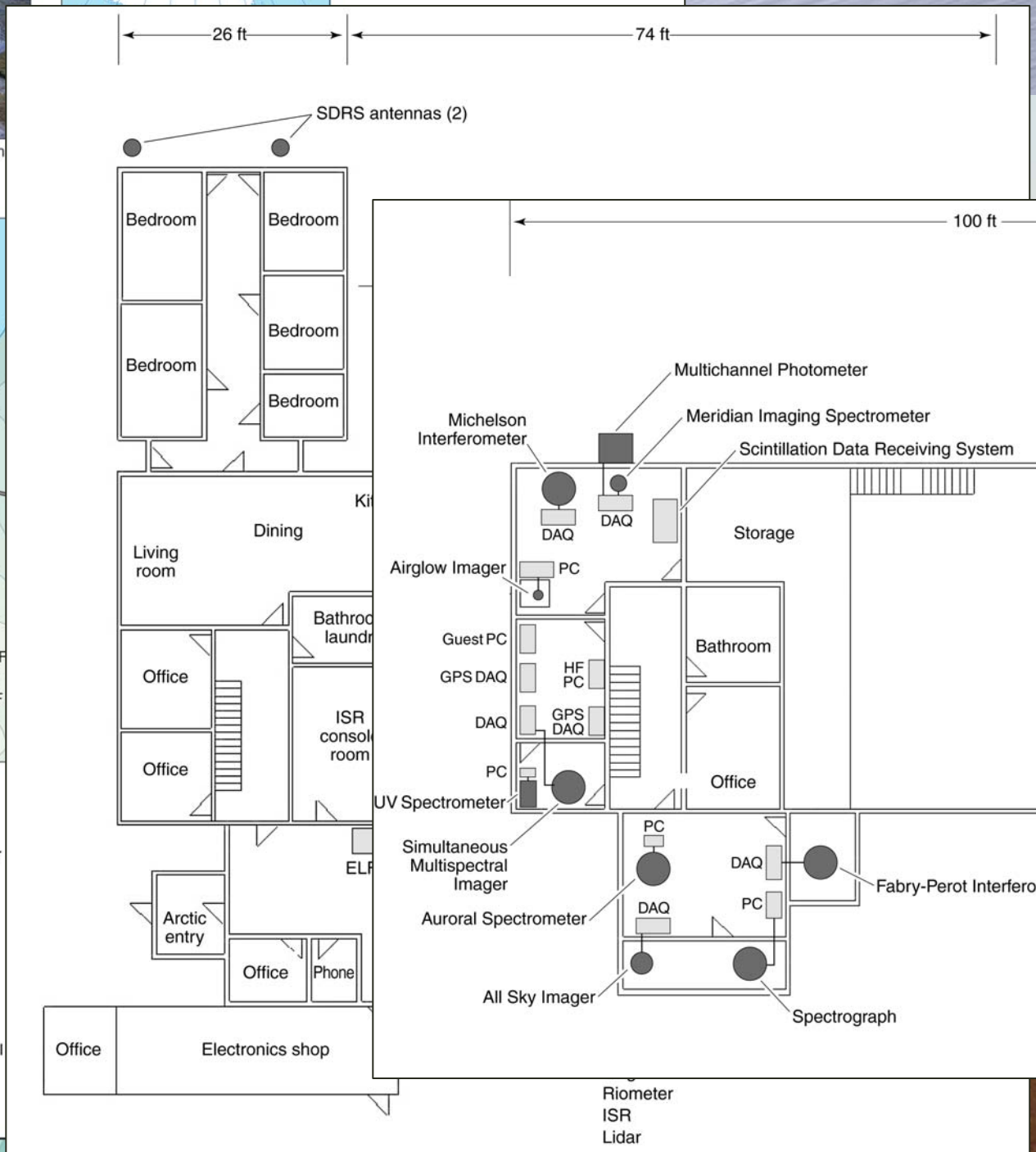


Research facility and ISR dish looking eastward, with Lake Helen in background.



- Airglow Imager
- All Sky Imager
- Auroral Photometer
- Fabry-Perot Interferometer
- Meridian Imaging Spectrometer
- Michelson Interferometer
- Multichannel Photometer
- Rayleigh Lidar
- Resonance Lidar
- Scintillation Data Receiving System
- Simultaneous Multispectral Imager
- Spectrograph
- UV Spectrometer

EXU03-046/f19



EXU03-046/f18

EXU03-046/f17

Sondrestrom instruments during the last five years

Instrument	Principal Investigator(s)	Institution(s)
Absolute Gravimeter	Toni van Dam	ECGS, Luxembourg
Airglow Imager	Gary Swenson	U. of Illinois Urbana-Champaign
All-Sky Imager	Elizabeth Kendall	SRI International
All-Sky Imager	Gary Swenson	U. of Illinois Urbana-Champaign
Auroral Photometer	James Hecht	Aerospace Corporation
Digisonde	Bodo Reinisch & Georg Larsen	U. of Massachusetts & DMI
ELF/VLF Receivers	Tony Fraser-Smith	Stanford University
Fabry-Perot Interferometer	Rick Niciejewski	U. of Michigan
HIRISE Imaging Spectrograph	Pallamraju Duggirala	Boston University
HF Imager	James LaBelle	Dartmouth College
Imaging Riometer	Ted Rosenberg & Peter Stauning	U. of Maryland & DMI
Incoherent Scatter Radar	Craig Heinselman	SRI International
IR Lidar Channels	Jeff Thayer	U. of Colorado, Boulder
Meridian Imaging Spectrometer	Gary Swenson	U. of Illinois Urbana-Champaign
MF/HF Receiver	James LaBelle	Dartmouth College
Michelson Interferometer	Gulamabas Sivjee	Embry-Riddle Aeronautical U.
Multichannel Photometer	Gary Swenson	U. of Illinois Urbana-Champaign
Ozone Spectrometer	Paul Eriksen	Danish Meteorological Institute
Particle Sampler	Stefan Norra	University of Karlsruhe, Germany
Rayleigh Lidar	Craig Heinselman	SRI International
Resonance Lidar	Craig Heinselman & Brent Watkins	SRI International & U. of Alaska
Riometers, three frequencies	Peter Stauning	Danish Meteorological Institute
Scintillation Data Receiving System	Santimay Basu	Air Force Research Lab.
Search Coil Magnetometer	Mark Engebretson	Augsburg College
Seismograph	Søren Gregersen & Diana Arachi	Danish Seismological Survey & USGS
Simultaneous Multispectral Imager	G. Haerendel & Josh Semeter	Max Planck Institute & SRI
Solid Earth GPS	Oivind Ruud & David Stowers	NCAR & NASA
Spectrograph, CCD	Abas Sivjee	Embry-Riddle Aeronautical U.
Sun Photometer	Wayne Newcomb	NASA
Three-Axis Magnetometer	Hans Gleisner	Danish Meteorological Institute
Three-Axis Magnetometer	Peter Stauning	Danish Meteorological Institute
Tomographic GPS	Trevor Garner	U. of Texas, Austin
UV Spectrometer	Rick Niciejewski	U. of Michigan

Poker Flat

Resolute Bay

Sondrestrom Management History

- Chatanika
- 11 years of user support
- Sondrestrom
- 25 years and counting

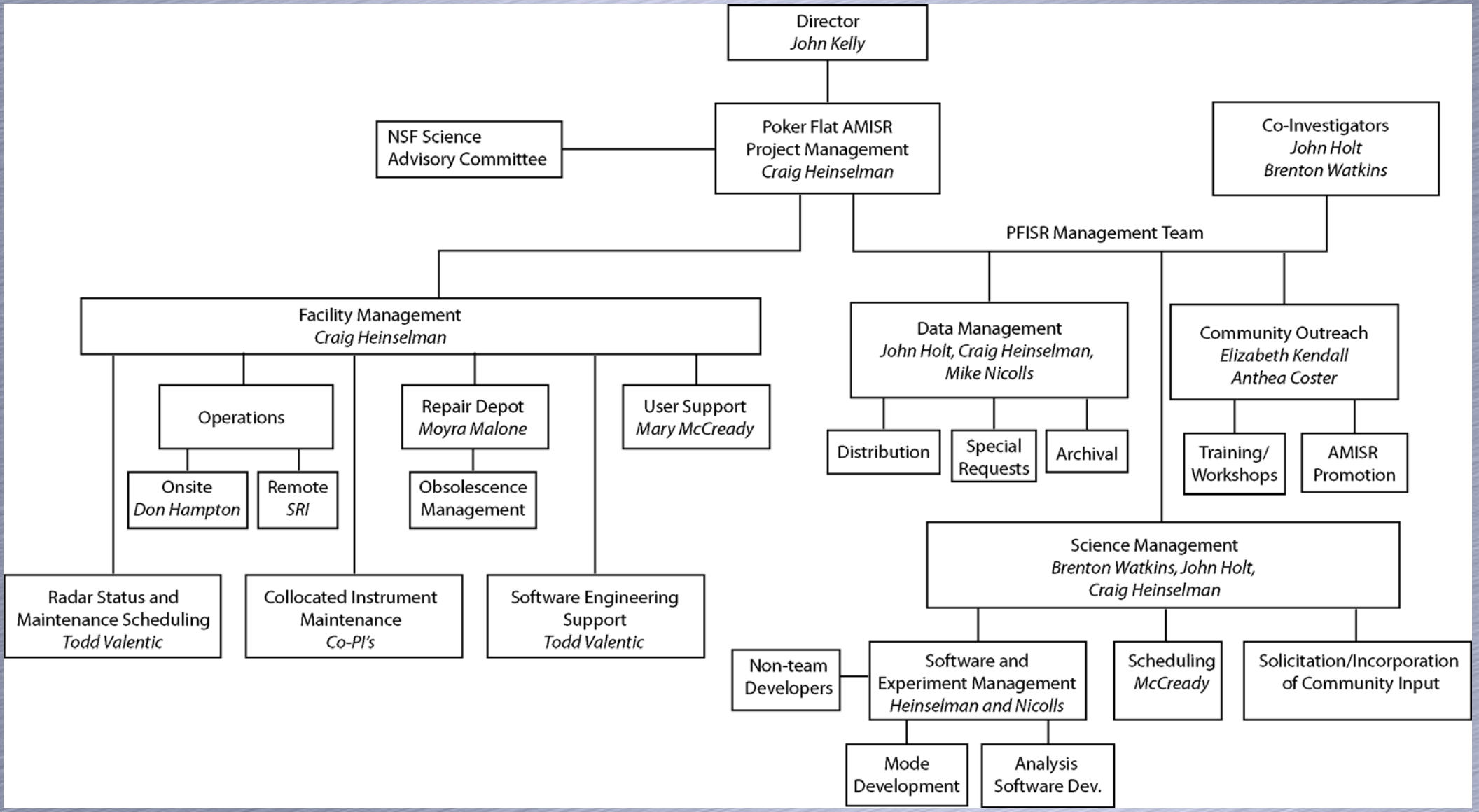
Facility Management Mandates

- NSF Cooperative Agreement Tasks
- Community Expectations of a UAF (Avery et al.)
- User Community Workshops (Inputs)

AMISR Cooperative agreement

- Required development and review of an O&M Plan
- Deliverables are managed separately and not included in the O&M Plan
- SRI infrastructure ensures reports are on time, financial details are fully accounted for, etc.
- SRI procedures cover all auditable items in a traceable manner (Gov’t requirements)
- SRI overhead supports additional auditing functions (e.g. Business Systems Reviews)

Management Structure



Community Expectations of a UAF (Avery et. al.)

- *Exercises good management and budget practices that provide for the successful operation of the facility functions listed above.*
- *Operates and maintains the facility and continuously improves the hardware and software systems to fully exploit the capabilities of the instruments.*
- *Acts as a resource for the space science community on matters that require expert judgments on the use and reliability of radar and radio techniques.*
- *Provides accurate, reliable, and validated measurements of key geophysical parameters using the clustered facility instrumentation whose data are easily and readily available to the user communities.*
- *Engages a broad variety of audiences through outreach activities.*
- *Performs and enables outstanding scientific research using the facility instrumentation and observation databases.*
- *Mentors early-career scientists and provides opportunities to develop leadership skills ensuring the next generation of facility leaders.*
- *Provides educational opportunities for undergraduate and graduate students.*

PFISR scheduling

Organization	2007 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep*	Oct*	Nov	Dec	2008 Jan	Feb	Totals
World Days	39		118		32	86			29.5			183	233		721
IPY - full power							5	60	20	86	37	29	26	58	321
Multiple Users								8	26		23	26	11	24	118
Aerospace Corporation				16								10			26
Boston University			59								67		35		161
Clemson University	22														22
Cornell University							34	119					28		181
Dartmouth College	15	48													63
EISCAT Scientific Association			13												13
Geophysical Institute of Peru								20					17	9	46
Lancaster University, UK			31												31
Millstone Hill, MIT														44	44
Northwest Res. Associates						24				3					27
Penn State U., Northwest Research Associates, U. of Wisconsin			24			24			30			24			102
Southwest Research Institute														14	14
SRI International		3			12	23	22	22	24	23	23	24	51	23	250
SRI and Others						7		14	14	14	14	24		24	111
University Centre in Svalbard (UNIS)												34	16		50
University of Alaska, Fairbanks		14		74				4			3	4	4	65	168
University of California, Berkeley									15						15
University of California, LA	2		35	8	49	42	31	23	24	33	43	54	58	84	486
University of Colorado, Boulder					10	24	35	12	12						93
University of New Hampshire	27	38													65
University of Tromsø, Norway															0
Utah State University							22	39							61
calibration	2									15				5	22
testing	8	5	2		2		3	1		7	1	1		1	31
Totals	115	108	282	98	105	230	152	322	195	181	211	413	479	351	3242
low duty cycle IPY			328	425	549	425	362	365	206	275	421	279	209	290	4134

PFISR scheduling

- Requests are received by email
  - Must include science objective and measurement goals
  - Iterative process results in:
    - operating mode details
    - dates and times
    - criteria for conditions
    - need for accompanying instruments

    etc.
  - Scheduling conflicts are resolved
  - Budgetary limitations are considered
  - Schedule is “finalized” before the 1st of the month

Conflict resolution

- Experiment sharing

  e.g., Mathews, Briczinski & Janches meteor experiments

- Automated window sharing

  e.g., Hysell & Cosgrove auroral activity

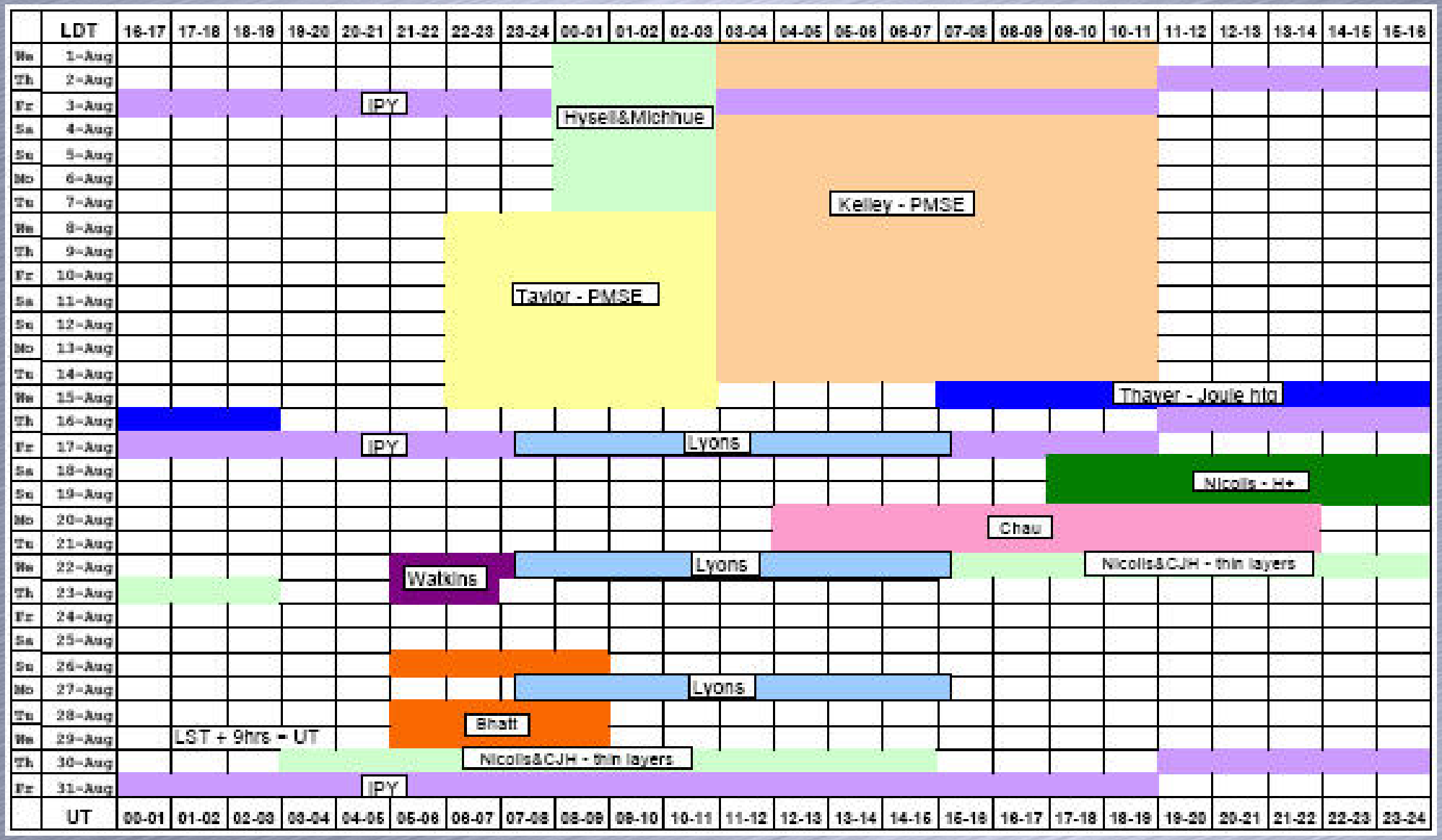
- Condition-based sharing with user selection

  e.g., Michell & Gustavsson on-site decisions

Conflict resolution

- If the conflicts cannot be resolved with experiment sharing, etc., the PFISR Management Team is consulted at the weekly (Thursday AM) teleconference
- For conflicts that remain unresolved at this point, NSF is contacted for direction

PFISR scheduling



Management Structure

- A successful UAF….
  - Exercises good management and budget practices that provide for the successful operations of the facility functions.
- NSF Cooperative Agreement ….
  - All responsibilities listed in the Cooperative Agreement
  - Management Plan Section 2, Page 1

Radar Operations

- A successful UAF….
  - Operates and maintains the facility and continuously improves the hardware and software systems to fully exploit the capabilities of the instruments.
- NSF Cooperative Agreement ….
  - Operate Poker Flat AMISR 1,000 hrs per year in support of high quality research programs.
  - Develop software for AMISR operating modes that will aid outside users in planning and conducting experiments.
  - Management Plan Section 3, Page 2

Time Allocation

- A successful UAF….
  - Acts as a resource for the space science community on matters that require expert judgments on the use and reliability of radar and radio techniques
- NSF Cooperative Agreement ….
  - Schedule, coordinate and plan experiments which make use of the Poker Flat radar.
    - Management Plan Section 4, Page 3 & 4

User Support

- A successful UAF….
  - Provides accurate, reliable, and validated measurements of key geophysical parameters using the clustered facility instrumentation whose data are easily and readily available to the user communities.
- NSF Cooperative Agreement ….
  - Assist users in the acquisition and analysis of data obtained with the AMISR radars, and contribute reduced data acquired during the coordinated community experiments.
  - Develop software for AMISR data analysis that will aid outside users in using the data for scientific research.
  - Encourage other users of the AMISR radar to include all appropriate scientific radar data collected at the radars in the CEDAR database.

User Support … continued

- A successful UAF….
  - Engages a broad variety of audiences through outreach activities.
- NSF Cooperative Agreement ….
  - Convene and organize workshops to facilitate AMISR science planning, demonstrate radar capabilities, and educate scientists and students on radar usage and data analysis and interpretation
  - Work closely with the NSF in a cooperative effort to inform the public about the Facility and its programs and accomplishments.
  - Management Plan Section 5.5, 5.6, 5.7; Page 7 & 8

User Support … continued

- A Successful UAF ….
  - Performs and enables outstanding scientific research using the facility instrumentation and observation databases.
- NSF Cooperative Agreement ….
  - Identify the needs of the scientific community for the AMISR radars and their data.
  - Carry out a broad-based research program in the atmospheric sciences.
  - Disseminate and publish in a timely manner scientific and technical information developed in the course of the project.

User Support … concluded

- A Successful UAF ….
  - Mentors early-career scientists and provides opportunities to develop leadership skills ensuring the next generation of facility leaders.
  - Provides educational opportunities for undergraduate and graduate students.
- NSF Cooperative Agreement ….
  - Engage in educational programs as may be appropriate to assist AMISR users and to encourage additional future use of the radar facility.
  - Management Plan Section 5.5, 5.6, 5.7, 5.8; Page 7 & 8

Results:usage of facilities

Facility	No. of Publications Using Facility or Facility Data	No. of Researchers Using the Facility or Facility Data	No. of Institutions Represented by Users	No. of Instruments Hosted at Facility	No. of Grad Students Helped	No. of Undergrads Helped	No. of Workshops Hosted	No. of Visiting Researchers Hosted
Sondrestrom (the last 5 years)	80	105 12 SRI 93 external	53	32	31	16	2	6 at SRI 84 on site
PFISR (since Jan 2007)	28	70 5 SRI 65 external	29	4 PFISR 8 others	14	7	3	5 at SRI 28 on site