SPACE INNOVATION FORUM 4 - 5 September 2019

Space Innovation

Summer

Christopher Frisk







Space Innovation Summer

Purpose and goals

Increase flow of potential startup-based research Make "progress" on project - 1st - Customer and market validation -> Forward strategies - 2nd - Tech verification, prototyping, demonstration, testing

Provide an outside perspective

Individual Development

Demonstrate regional attractiveness

THREE CASES



Are you sure that your product will work in space?

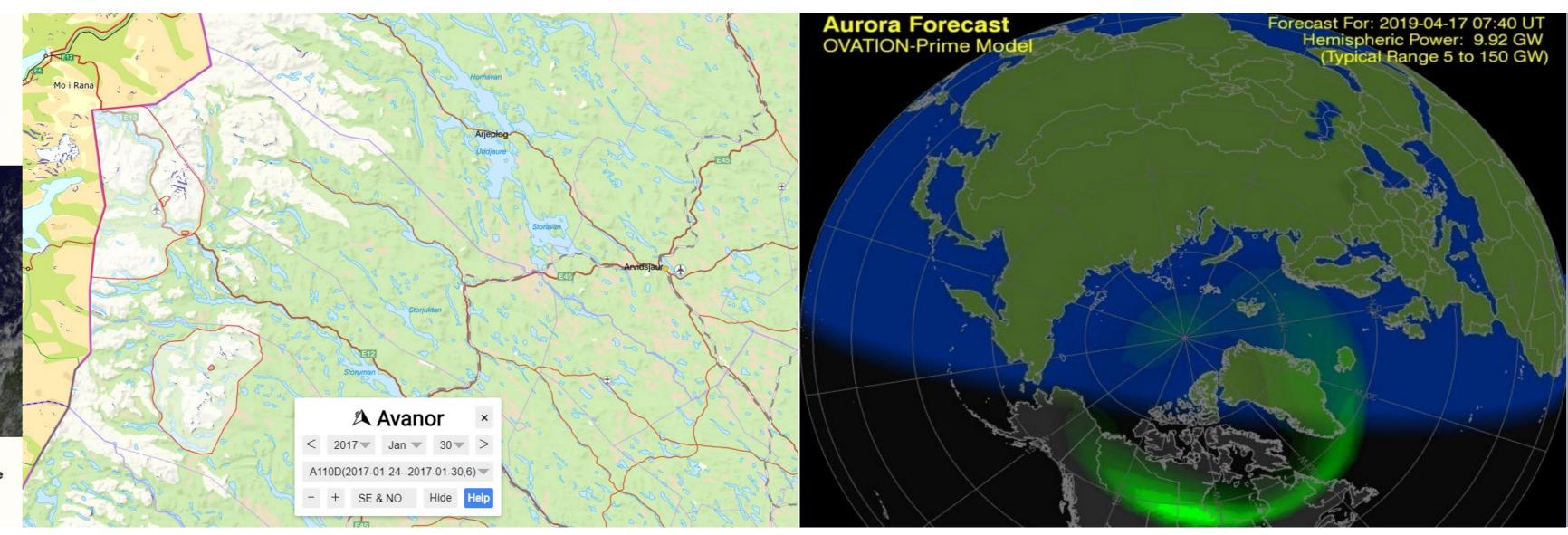
Let us show the world that it will.

PASQ offers independent space environment qualification as a service. Whether you're already active in the space segment or not, we're here to help you and your products to successfully operate in space.

PASQ- Space Equipment Testing and Qualification

Mauro Rojas Niels De Graaf

CASE OWNER Emil Vinterhav



ANOVO – Avanalanche Forecast Application



Aydin Najhaee Zadel

Rebecka Svensson

CASE OWNER

Masatoshi Yamauchi

IRF – Aurora Forecast Application and API

Aron Widforss Rickard Åkerstrand

> CASE OWNER: Aron Widforss



remote avalanche prediction

Make earth benefit from space





the problem

Costly

Current avalanche forecasts are done manually on the ground.

Meaning \rightarrow

•

Time consuming

Good knowledge about prioritized areas

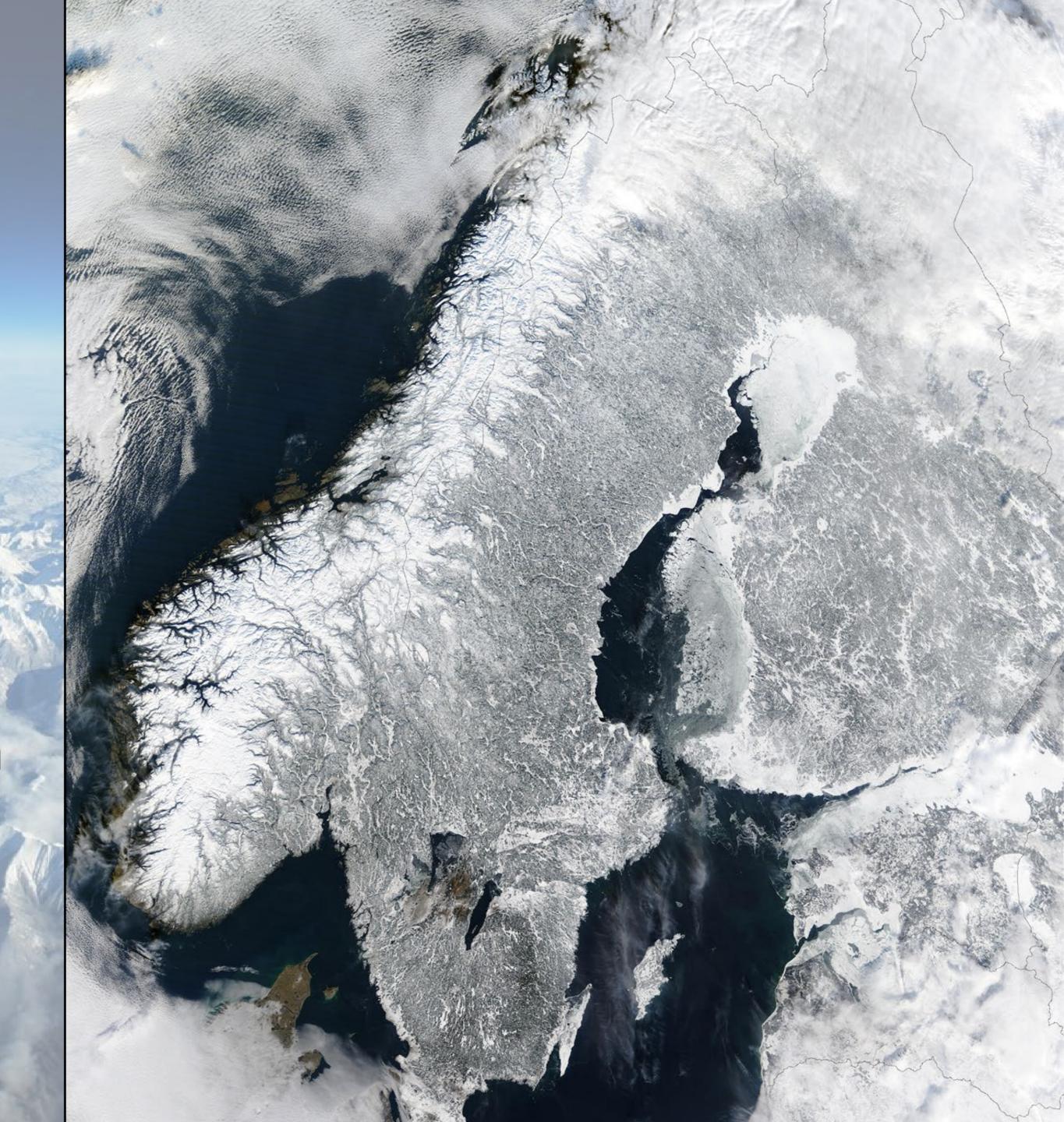
Bad knowledge about unprioritized areas

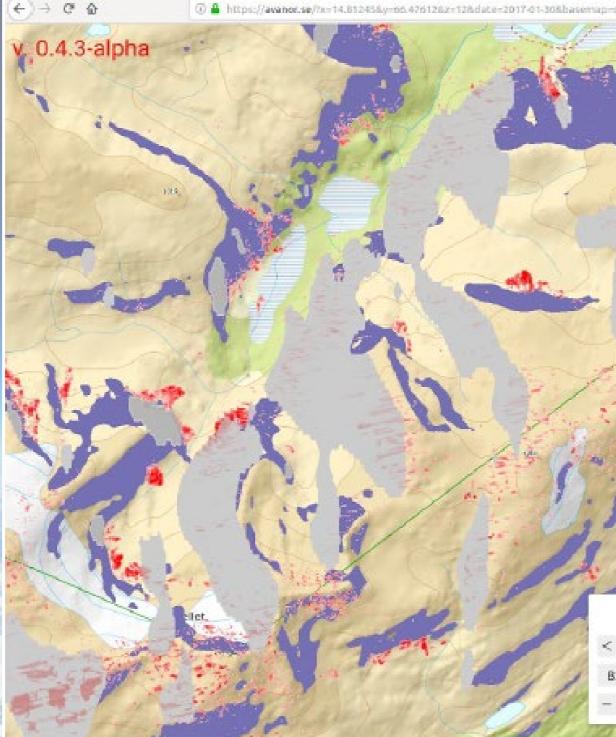
Loss of lives



our solution

- We use space!
 - Scan the ground with radar images and compare them on a day-to-day basis
 - Predict avalanches without going there
 - Web-application with a subscription
 - We save lives
- **Complement to current methods**





< Sarel	national par	< >	WEATHER FOREC	CAST			NOTIF	ICATIONS			
Next image	2019-02-2		-	-23	I	6 0.0mm	۵	2019-02-27 13:45:0 New satellite image Satellite: Sentinel2			
Last image Area used Current plan: proffesion		0000 hectares	15:00	RH 27%	I	✓ 2.2m/s	۵	2019-02-27 08:52:0 New satellite image Satellite: Landsat			
Historical data for area		+ add heclares	Д	-20 RH 30%	I I	8 0.0mm ▶ 2.72m/s	۵	2019-02-28 11:28:1 New satellite image Satellite: Sentinel2			
Average avalanches detected this	icted per season	47		-16 RH 37%		≜ 0.0mm → 4.59m/s	o	2019-02-25 22:08:0 New satellite image Satellite: Sentinel2			
Statistical chance of avai		42 %	FRI	-11 RH 40%	 	≜ 0.0mm → 4,83m/s	۵	2019-02-25 06:32: New satellite image			
					Data pre	wided by OpenWeatherMap				1	nat el
Detected events		6 🛨									
Focus areas		5 🖽	CALENDAR						<	Feb 201	9
Active alarms		0 🛨	MON	TUE		WED	THU	FRI	SAT	SL	JN
Field reports		5 🖪									
Saved events		43 🛃	1		2	3	4	5	3	ó	

IN 🖸 🚰 🖬 😝



	AI	Avan	ог	×
20	17 =	Jan 🔻	30	r >
29A(2	017-01-	242017	-01-30,6	0
+	SE &	NO	Hide	Help
-	J.J	1.28	11	1.1

om	FICATIONS	
)	2019-02-27 13:45:05 New satellite image Satellite: Sentinel2	
>]	2019-02-27 08:52:08 New satellite image Satellite: Landsat	
51	2019-02-28 11:28:15 New satellite image Satellite: Sentinel2	
ו	2019-02-25 22:08:53 New satellite image Satellite: Sentinel2	
)	2019-02-25 06:32:12 New satellite image	mark of an inset



Progress during the summer:

- From technology to business opportunity
 - Business Model/ Revenue
 Model

First paying customer
 Avalanche Canada



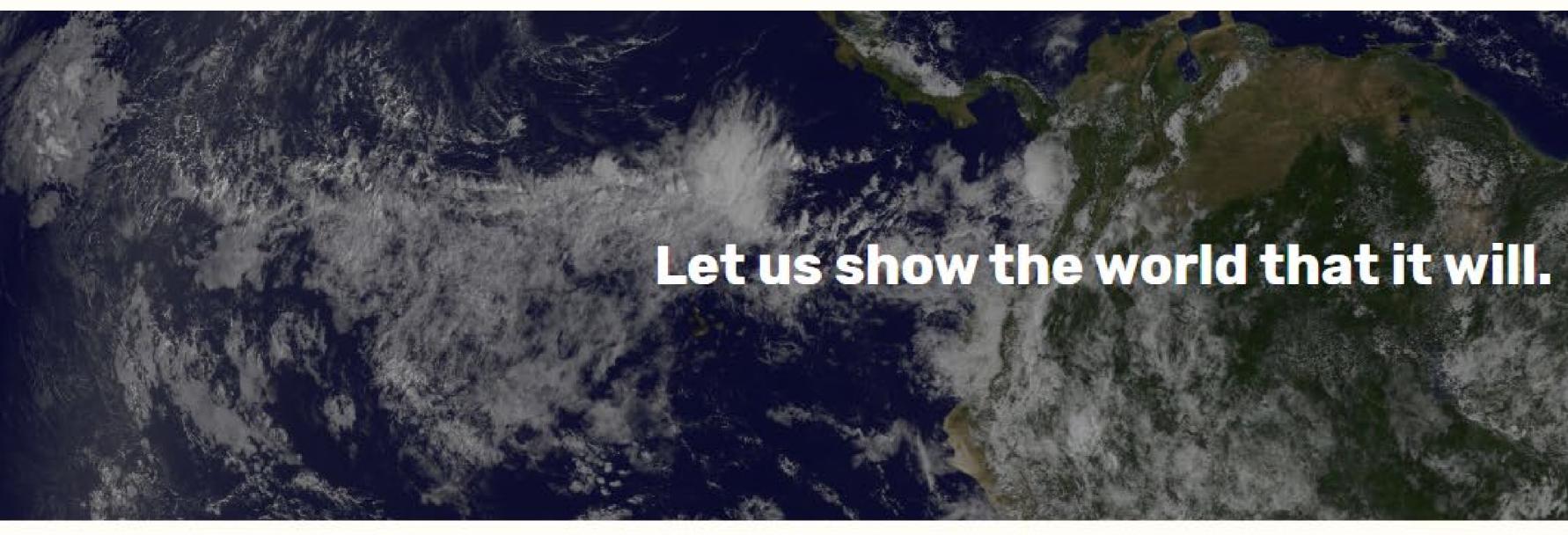
- Customer Validation
- Market Size Estimation
- Profit Forecasting
- Product Development
- Etc,...



Independent Space Qualification

HOME SERVICES REFERENCE PROJECTS ABOUT US CAREER CONTACT

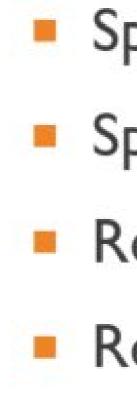
Are you sure that your product will work in space?



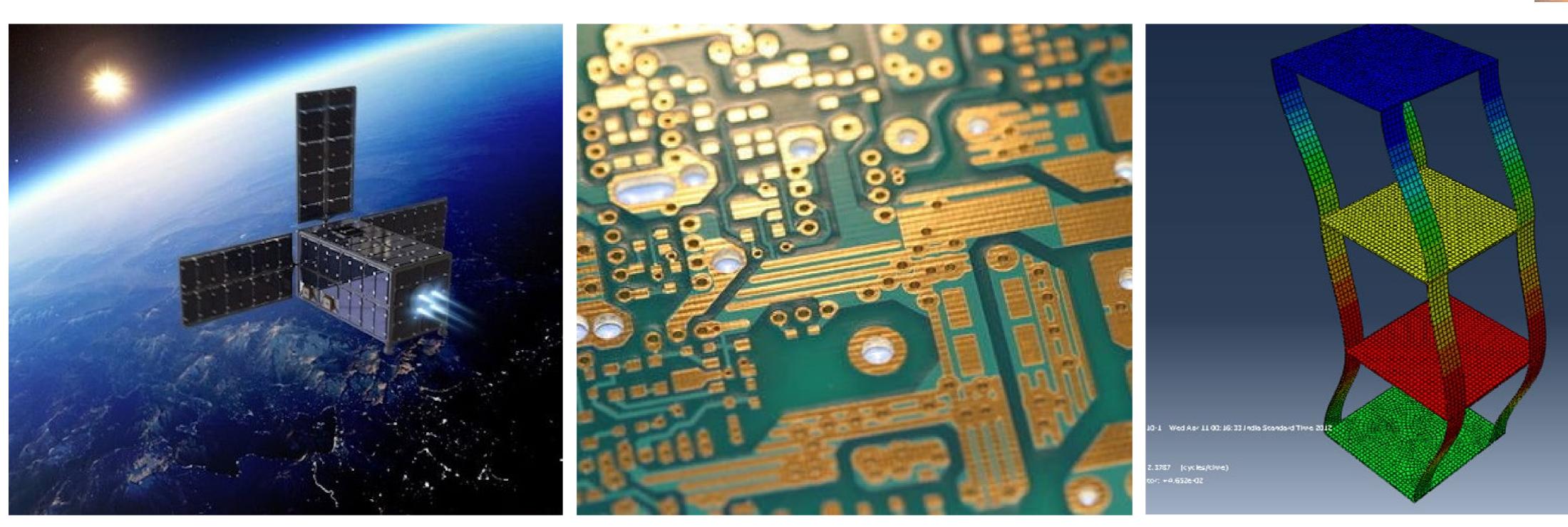
Mauro Rojas – Niels De graaf Laniel



WITH THE NEW SPACE MARKET COMES A NEED



- Space testing is expensive
- Space is a harsh environment
- Requires expertise
- Requires facilities



THE SOLUTION OF PASQ THERMAL, RADIATON AND VIBRATION TEST SPACE QUALIFICATION





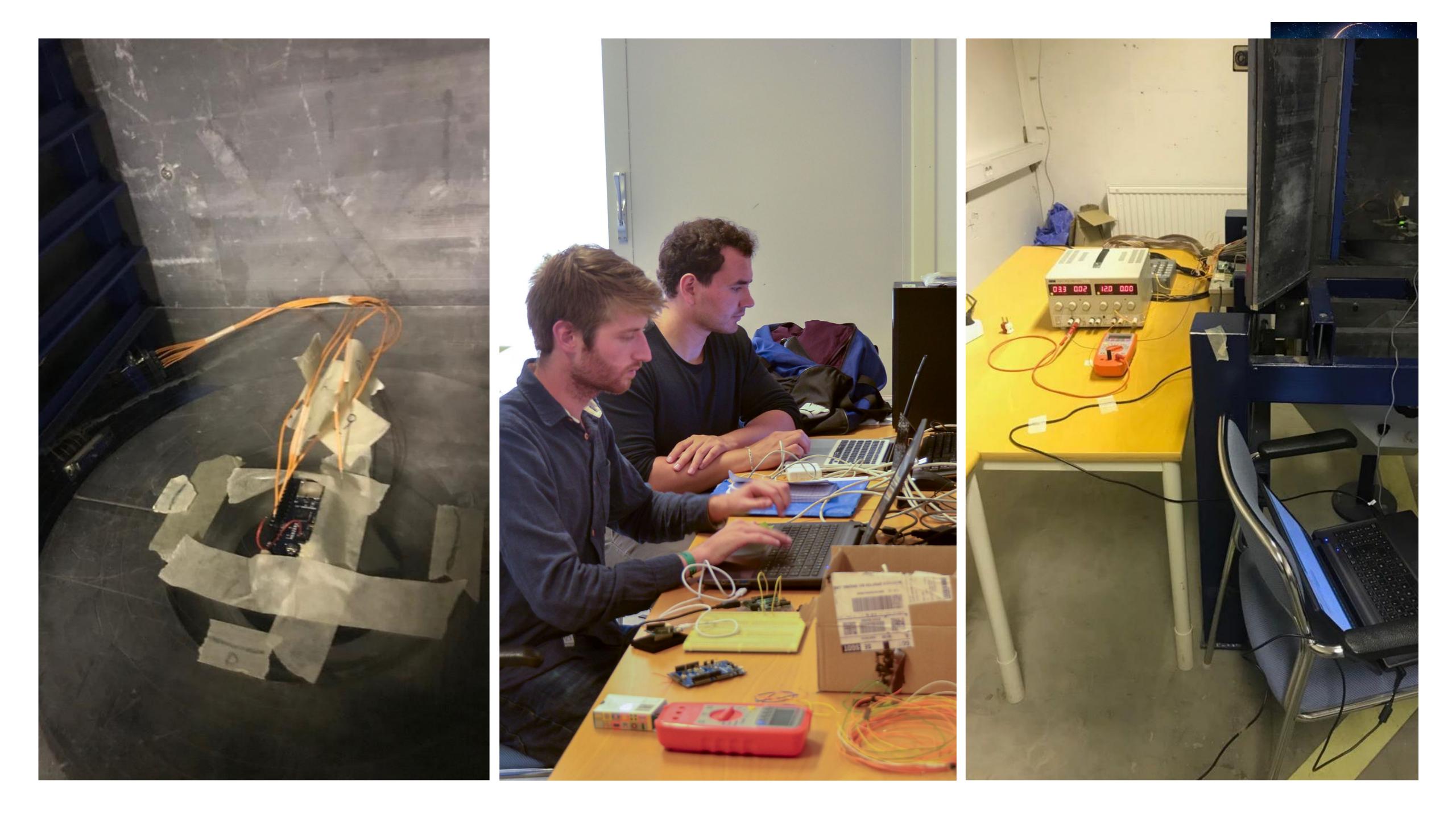




PROGRESS DURING THE SUMMER:

- DEVELOPMENT AND EXCECUTION OF RADIATION TEST (PRODUCT DEVELOPMENT)
- OPTIMIZATION OF TEST PROCEDURE
- ESTABLISHEMENT OF CONTACT WITH FIRST POTENTIAL CUSTOMER FOR PASQ
- DISCOVERENCE OF MARKET NEED FOR ADDITIONAL SERVICES (test of subsystems and components)





AURORA CASE

REBECKA SVENSSON & AYDIN NAKHAEE-ZADEH



INSTITUTET FÖR RYMDFYSIK Swedish Institute of Space Physics



THE CASE

- IRF have made lots of research on Aurora
- How can they present this data to the general public?
- Create some kind of business opportonity based on this data?



oublic? d on

BUSINESS MODEL

PROBLEM/SOLUTION

PROBLEM (End-User Perspective)

AURORA is unpredictable for short and long term

Good places to spot AURORA are hard to locate

Aurora forecast not correlated with other data

Current methods are based on unreliable data (KP-value)



SOLUTION

API that weather apps can use to present Aurora forecasts

Aurora application that will be avaliable on Appstore, and Google Play

BENEFITS

5-minute aurora alerts Long-term aurora forecasts Local data instead of KP-value Presented togheter with weather data

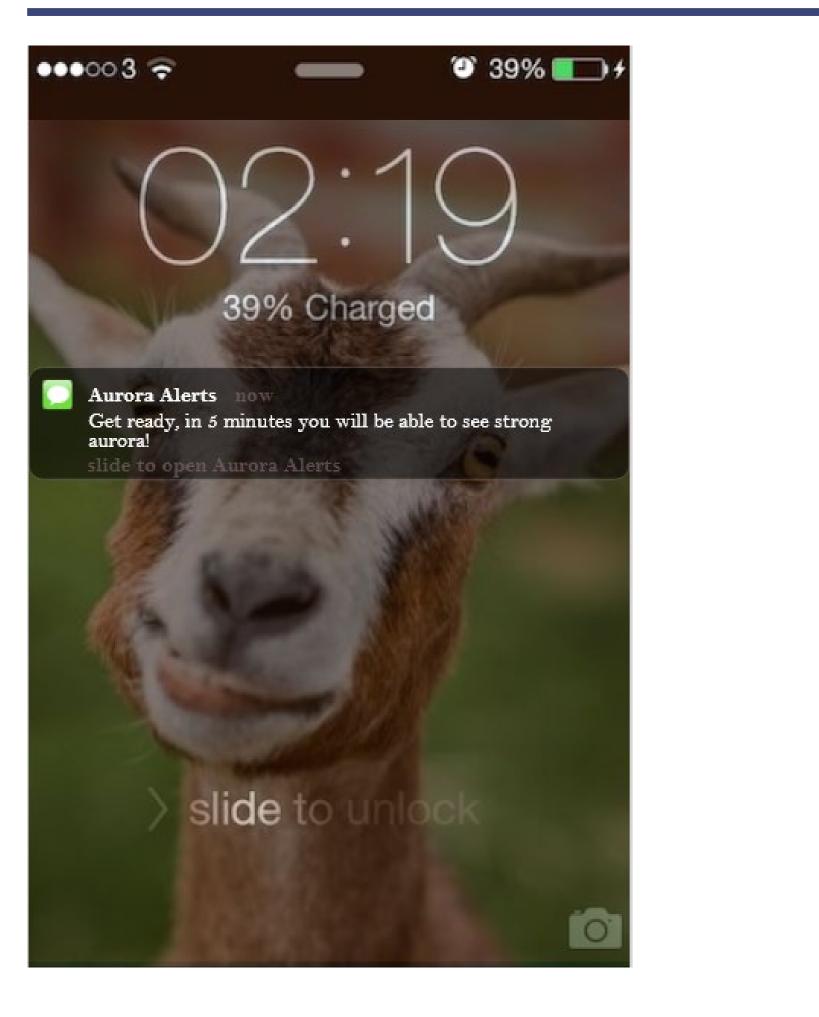
Both these pictures show high KP-value





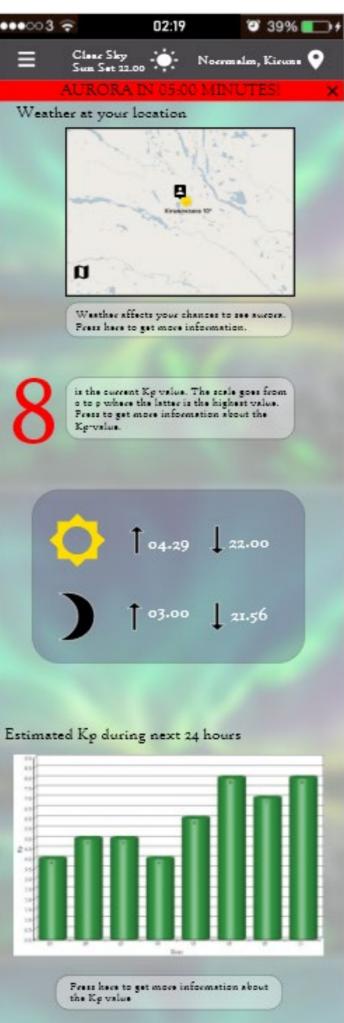


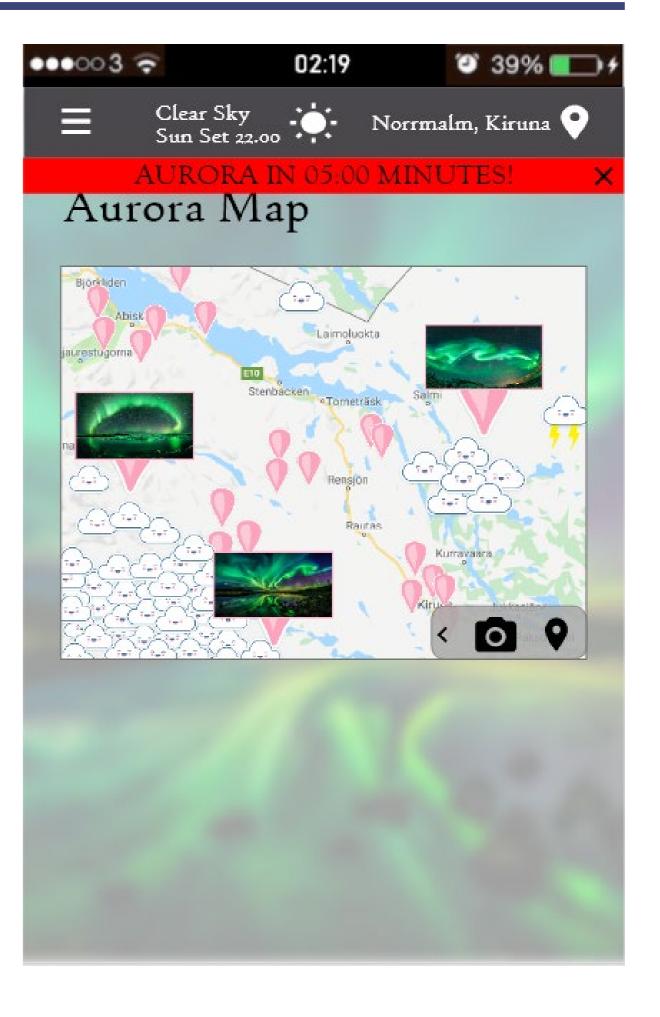
A LOOK INTO THE APP



≡







LTU BUSINESS AB

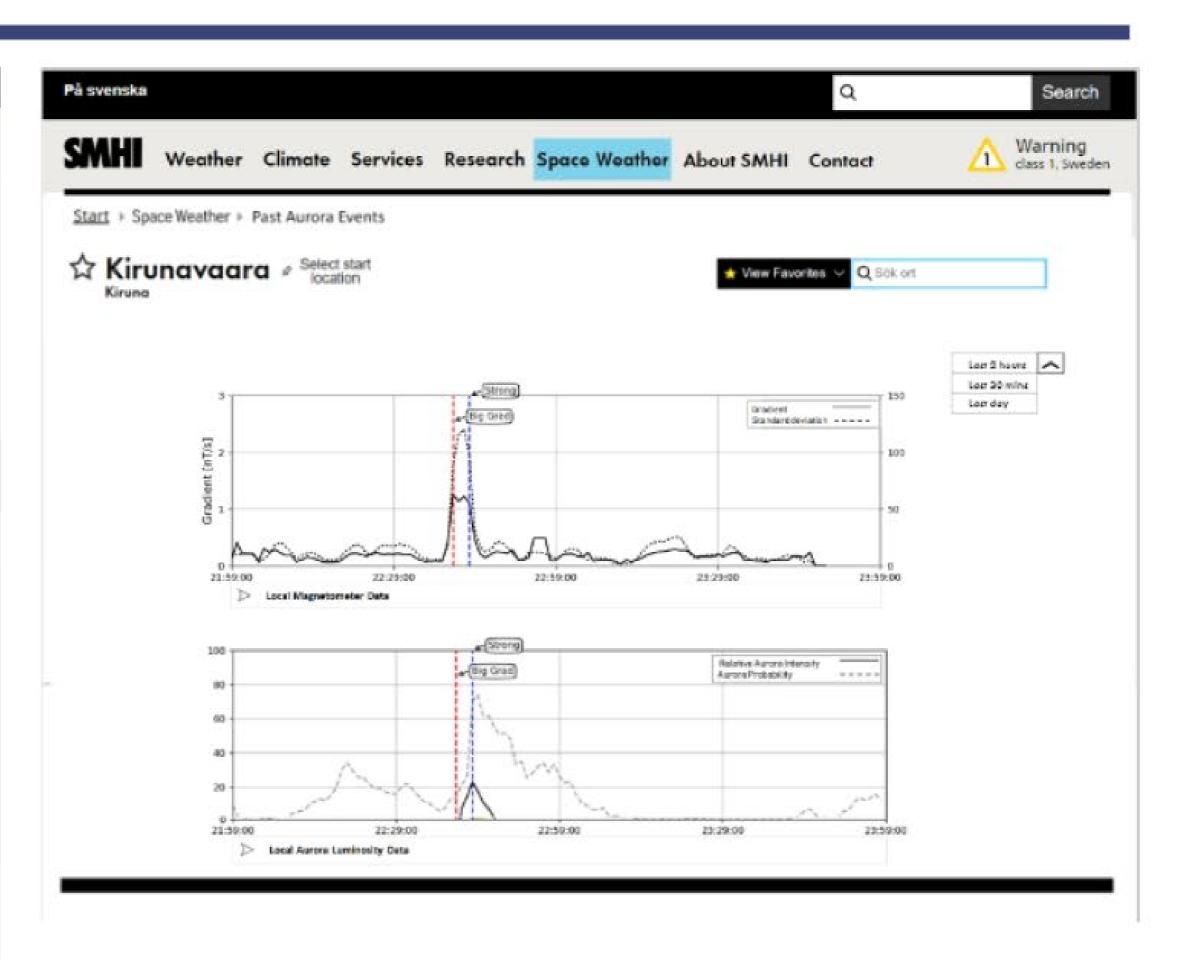


A LOOK INTO THE API

På svenska			Q	Search
Weathe	r Climate Service	s Research Space W	eather About SMHI Contr	act Marning dass 1, Swede
Start + Space Weather	3-days Aurora Forecas	t		
Kirunavad	ara / Select start location		🛨 View Favorites 🗸	Q Sök art
E Chart Chart				Prin
DAY	KPINDEX	WEATHER	MOON PHASE	SOLUTIONS UP / DOWN
TODAY Aug 7	5	● 8*C 7*C	•	32:24 22:02
TOMORROW Aug 8	3	8*C	•	3:29 21:58
FRIDAY Aug 9	2	12 ° C	0	-32 03:33 21:53
AL AU	200 200 200 0 100 0 100 0 100 0 100 0 100 0 100 0 100 0 100 0 100 0 100 0	Aug 08	216.4 107.2 -93.8 Aug 09	Aug 10
			1993 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 -	

These indices describe the level of disturbance reconfectby the magnetometers of the anoral zone. Horizontal reconfings of magnetic components of a set of stations survausding the globe an drawn at the same time and amplitude scales in relation to their silent time levels and then ownlag graphically. The upper and lower concluses of this overlay define the AU (upper amplitude) and AL (lower amplitude) indices, respectively. The difference between the two antelepes determines the AE (Asianal Electrojet) index, that is, AE = AU - AL. AO is defined as the average value of AU and AL.





PROGRESS DURING THE SUMMER:

- DEVELOPMENT OF BUSINESS IDEA
- VALIDATION OF BUSINESS IDEA
- BUSINESS MODEL/ REVENUE MODEL
- ESTABLISHMENT OF CONTACT WITH FIRST POTENTIAL CUSTOMER (SMHI)
- MARKET SIZE ESTIMATION
- PROFIT FORECASTING
- ETC.
- IRF NOW HAVE A VALIDATED BUSINESS IDEA WITH A FIRST POTENTIAL CUSTOMER READY TO LAUNCH





SPACE

FRANK YOU

INNOVATION GROWTH COOPERATION

