MADMAX Critical Decisions:

Theory:		
	Theoretical Show stopper? ✓	mid 2017
	Influence of Clustering?	
	Classicality issue? ✓	
	Phase space argument (gammas not normal to 10^-3 deg)	end 2017
	Influence of "beam shape"	
	Do all disks have to be magnetized?	

MADMAX Critical Decisions:

Experiment:			
	Magnet		
		What is the design (B^2 A, Length)?	Mid 2018
		Prize and Time line?	Mid 2018
		Fringe field?	Mid 2018
		Homogeneity?	
	Booster		
		Noise tempreature and real temperature?	
		Tiling possible to 1m^2 with LaAlO3?	
		Precision of tiles?	
		Influence of Tiling on tan delta	
		Loss rate low enough?	
		Precision of disc placement good enough (extrapolated to many discs)	

MADMAX Critical Decisions:

Experiment:		
	Receiver	
	Max. temperature	2017
	Technology for > 40 GHz?	2018-2020
	What resolution is needed for amplitude measurement (16bit as done at the moment? Could be lower?)	
	What frequency-bandwidth is needed?	
	Interface Booster-Receiver	
	Noise temperature of mirror, feedthrough, horn as fct of real temperature?	

MADMAX Critical Decisions:

Experiment				
	Disc positioning			
		How long does the booster re-alignment last?		
	Calibration receiver and booster			
		How to calibrate?		
		How often to calibrate?		
	Prototype Test			
		Successful?		

Some work packages:

Tasks	MPP, ZU, ?
Theory	
Mini Clustering	
Influence of Clustering on search strategy	
Influence of Magnet length	
Influence of „beam shape“	
Phase space argument (photon emission angle variations)	

Some work packages:

Tasks	MPP, UHH, ??
Proof of Principle Experiment	
Five disc Booster	✓
20 disc Booster	work in progress
Radiometer	✓
Discs	
Choice of material	
Tiling	
Fake Axion calibration	
Antennas and mirrors	

Tasks	MPP, UHH, ??
Prototype booster	
Design of prototype	
Encapsulation (suitable for B-field)	
Booster	
Cryogenics for booster (see below)	
Production of Prototype	
Characterization	
Needed Temperature of components known	
Final Booster	
Discs	
Positioning System	
Calibration/ Fake Axion	

Some work packages:

Tasks	MPP, Saclay
Magnet	
Start innovation partnership	
contest for participation	✓
Evaluation of applicants	✓
Preparation of offers	✓
Negotiations	✓
Evaluation of final offer	
Start of innovation partnership	
Design Study	
Decision on Magnet type	
Build prototype	
Build final magnet	

Some work packages:

Tasks	**MPP, MPIfR, ??**
Receiver	
Low Frequency (10-40 GHz)	✓
High Frequency (35 - 100 GHz)	

Work Packages:

Tasks	UHH, DESY, ???
Cryogenic System(s)	
Design of cryogenic components	
Mirrors and Feedthroughs	
Site infrastructure	
Definition of criteria for site	
Selection of potential sites	
Measurements at good sites	
Decision on site	
Preparation of contracts at site	
Planning of site infrastructure	
Preparation of site infrastructure	
Interfaces and integration	
Computing and Analysis	
Slow Control	

From the MADMAX persepctive:

Work Packages:

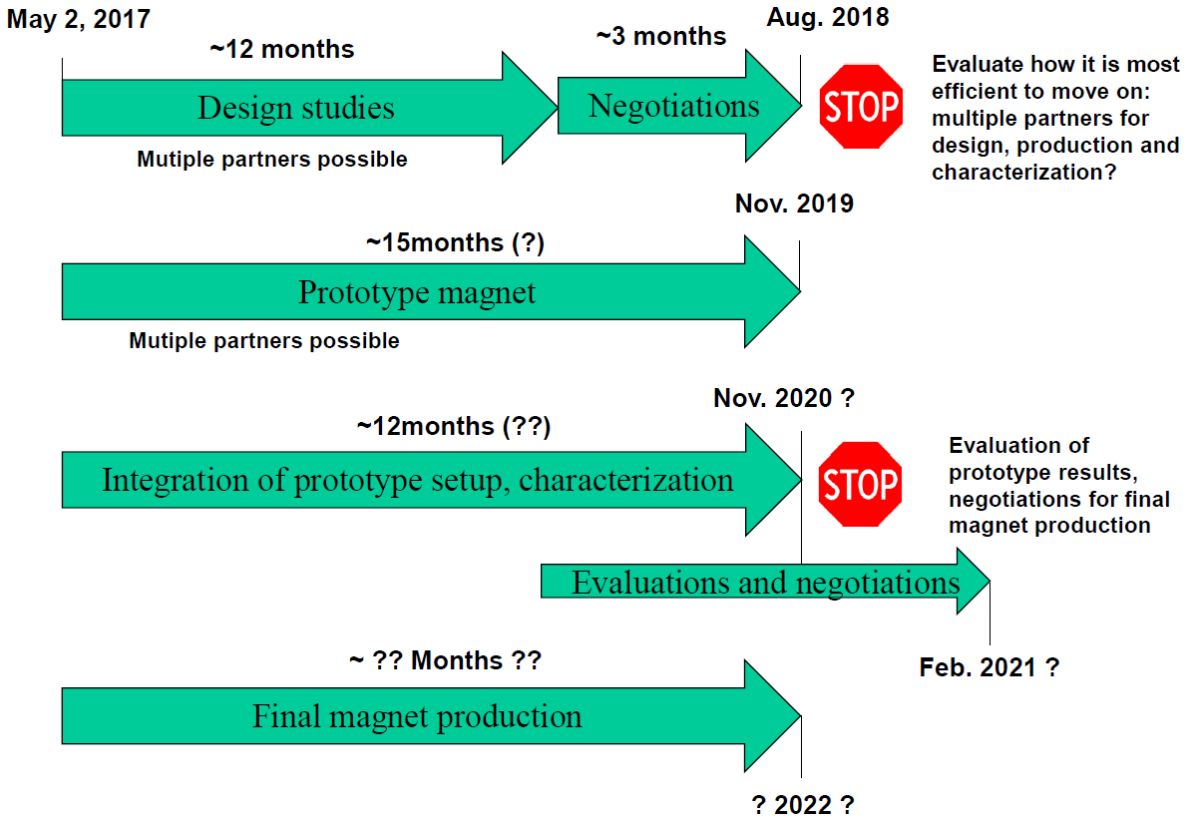
Tasks
Collaboration and Management
Committment Phase
Commitments above critical threshold
Collaboration Structure
MoU
Definition of management structure
MoU signed
Finances

From the general persepctive:

Overall Time Schedule:

Will be driven by magnet time schedule

→ Start measurement in 2022(?) (with MADMAX magnet)



https://www.newscientist.com/article/mg23230974-700-physics-tweak-solves-five-of-the-biggest-problems-in-one-go/

http://www.nature.com/news/axion-alert-exotic-particle-detector-may-miss-out-on-dark-matter-1.20925

http://www.deccanherald.com/content/581069/an-exotic-article-detector-may.html

http://www.n24.de/n24/kolumnen/Prof-Ulrich-Walter-Wissenschaft/d/9390822/der-durchbruch-bei-der-dunklen-materie-.html

From the MADMAX persepctive:

Mad Max	**1. Magnet** Critical Decisions: Which technology?	1. Prototype magnet	Magnet Coils	
			Shield against fringe field	
			Magnet Cryogenics	
		2. Final magnet		
	2. Booster Critical decision: Temp. booster needs to be cooled to Tiling scalable to 1m	1. Booster Seed setup Main tasks: Proof of principle Influence of tiling Booster noise temperature	Discs	Disc holders/Support Tiled discs
			Positioning System	Disc support
				Motors
				Transmission Motor-Disc
				Support-Rails
				Disc position control
			Calibration/Fake Axion	
		2. Booster Prototype Main tasks: Scalability to more disks and bigger diameter Cooling technology	Discs	Disc holders/Support Tiled discs
			Positioning System	Disc support
				Motors
				Transmission Motor-Disc
				Support-Rails
				Disc position control
			Calibration/Fake Axion	
			Cryogenics	
		3. MadMax Booster	Discs	Disc holders/Support Tiled discs

From the MADMAX persepctive:

Mad Max			
	3. Booster to Radiometer interface	Parabolic mirror	
		Feeddthrough to cryostat	
		Horn antennas	
	4. Radiometer	Detector	Software
		Heterodyne mixing	
		DAQ	
		Cryogenics	
	5. Experimental Hall	Power	
		Technical gases	
		LHe lines	
		Support	
	6. Software	Analysis	
		Slow Control	