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# Research Data Management and Metadata in Plasma Technology

## Introduction

- The project InPT-Dat ("Interdisziplinäre Plasmatechnologie-Datenplattform") aims to tackle the question of how research results in the different fields of low-temperature plasma physics (physics, chemistry, biology, medicine and very recently agriculture) can effectively be linked together and made accessible and reusable for scientists and industry in the different fields.
- The goal is to develop a metadata schema allowing research data management in accordance with the FAIR data principles (Findable, Accessible, Interoperable and Reusable).
- The metadata schema is applied for the development of a research data repository at INP in Greifswald.

## Conception of the data management platform

# Plasma specific metadata

 An interdisciplinary plasma technology metadata schema is suggested based on the commonly accepted general metadata schema Dublin Core Terms

## **Dublin Core Terms**

Plasma sourc

Medium

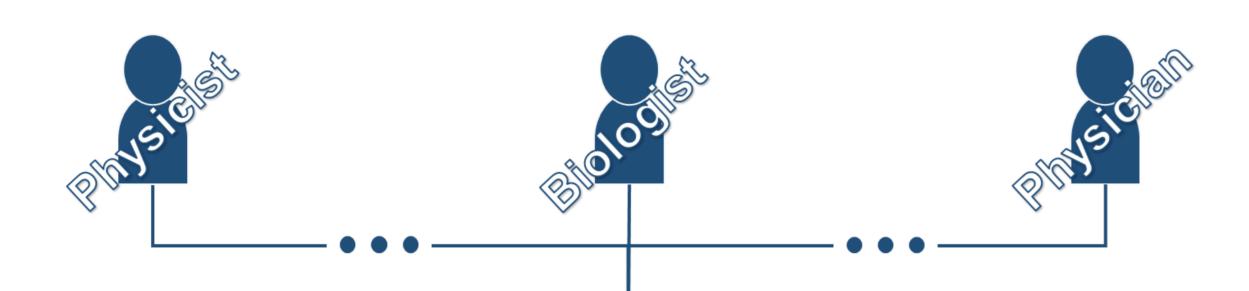
e.g. air

Target,

e.g. tissue

Q

Label	Field	Content	
	(schema.element.qualifier)		
Description	dct.description	Abstract or summary	
Group	dct.publisher	Department	
Title	dct.title		
Торіс	dct.subject	From taxonomie of subjects (topics)	
Licence	dct.rights.licence	e.g. Creative Commons Attribution	
Authors	dct.contributor.creator		
Permanent Identifier (DOI)	dct.identifier.doi	DOI of the dataset	
Permanent Identifier (URI)	dct.identifier.uri	Uniform Ressource Identifier (URL)	
Is supplementing (referencing)	dct.relation.references	Reference to published paper	
Rights	dct.rights	Access level	
Language	dct.language	Language used	



#### InPT-Dat data platform

- <image>
- Storage and sharing of research data
- Reference to corresponding publications
- Content indexing and full-text search
- Direct linking and visualisation of data records
- Directory of plasma sources and applications

#### Benefit

- Version-safe long-term archiving of research data according to the guidelines of good scientific practice.
- Simplified reuse of interdisciplinary research data, especially for researchers from other fields.
- Merging of heterogeneous research data from different fields of science → generation of new scientific findings.

## Extension: Interdisciplinary Plasma Technology Metadata Schema

Label	Field (schema.element. qualifier)	Content
	plasma.source.	Name of the plasma source.
name	name	(Preferably from a list of names plasma sources.)
Plasma source	plasma.source.	Application the plasma source
application	application	is intended for. (Might be more
		than one. Preferably from a list
		of named plasma applications.)
	plasma.source.	Properties of the plasma
properties	properties	source. (power, current
		amplitude, current waveform,
		frequency, gas, etc.)
	plasma.source.	Procedure to prepare the
procedure	procedure	plasma source. This field
		should also be used to
		described the whole procedure
		including medium and target.
		That is a (standardized)
		procedure to treat a medium (if
		relevant) and act on a target (if
		necessary).

# Status of the data management platform

- The Drupal based open data platform DKAN is used as a basis to establish an institutional research data management platform at INP.
- The integrated DKAN features and Drupal modules for direct data access and online visualization are used for linking related data.

#### Data set view

InPT-Dat – The Data Platform for Plasma Technology Leibniz Institute for Plasma Science and Technology

Datasets Innovations	Topics 🔻	Groups About		Log in Register
Y Home / kINPen® MED	) / Dataset	/ Search		
Plasma source	^	3 results		
kINPen® MED	×	Search	Sort by	Order
kINPen® 09 (1)		Search	Date changed ~	Descending ~ Apply Reset
Application	~	<u> </u>		
wound healing (3)		Introduction	to DIN-specification 91	315 based on the characterization of
decontamination (1)			et kINPen® MED	or based on the characterization of
Groups (Departments)	~	A Plasma Life Science	ce (PL)	
Resource file type	~	🖓 Plasma Medicin	e	
Resource data type	~			d risks of research. For the innovative field of plasma
Authors	~	first German DIN (.		be identified until now. The present study introduces the
License	~	2x csv		

Label	Field (schema.element. qualifier)	Content
Medium name	plasma.medium. name	Medium name the plasma source is acting on or operated in (e.g. water, dry air). The medium is an optional meta datum and must be given only if the action of the plasma on a target is mediated by some substance without presence of a plasma.
Medium properties	plasma.medium. properties	Properties of the medium, like humidity (air), distilled water.
Medium procedure	plasma.medium. procedure	Standard procedure to prepare the medium (pre-treatment).

Label	Field (schema.element. qualifier)	Content
Target name	plasma.target.	Target name the plasma source
	name	is acting on either directly or
		mediated by the above named
		medium. Can be omitted if only
		the characterization of a
		plasma source is intended.
Target	plasma.target.	Properties of the target (SiO <sub>2</sub> ,
properties	properties	polymer, bacteria).
Target	plasma.target.	Standard procedure to prepare
procedure	procedure	the Target (pre-treatment).

#### LabelField (schema.element.Content

#### References

http://www.inpt-dat.inpgreifswald.de https://www.drupal.org https://getdkan.org http://dublincore.org





# Specifications of kINPen MED

This data set gives technical details and specifications of the cold atmospheric pressure plasma source kINPen® MED.

3x csv

The Plasma Jet kINPen – A Powerful Tool for Wound Healing Plasma Life Science (PL)

Plasma Medicine

The development of cold atmospheric pressure plasma sources was the starting point for the innovative field of plasma medicine many years ago. Today, a large body of information is available on the bio- medical and clinical applications of plasma...

2x html

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		qualifier)	
	Resource file	plasma.resource.	Which file types are saved with
	type	filetype	this dataset. (pdf, jpg, ascii,
			proprietary file types, etc.)
	Resource data	plasma.resource.	Which kind of digital data are
Resource data,	type	datatype	saved with this dataset
			(report/pdf, SEM image/jpg,
			cfu-plot/ascii, Proteomics, 2D
			optical emission spectroscopy,
e.g. SEM image			etc.). Additional metadata might
			be given with certain data
			types.
	Resource	plasma.resource.	In which range the resource is
	range	range	valid.
	Resource	plasma.resource.	Data quality score.
	quality	quality	