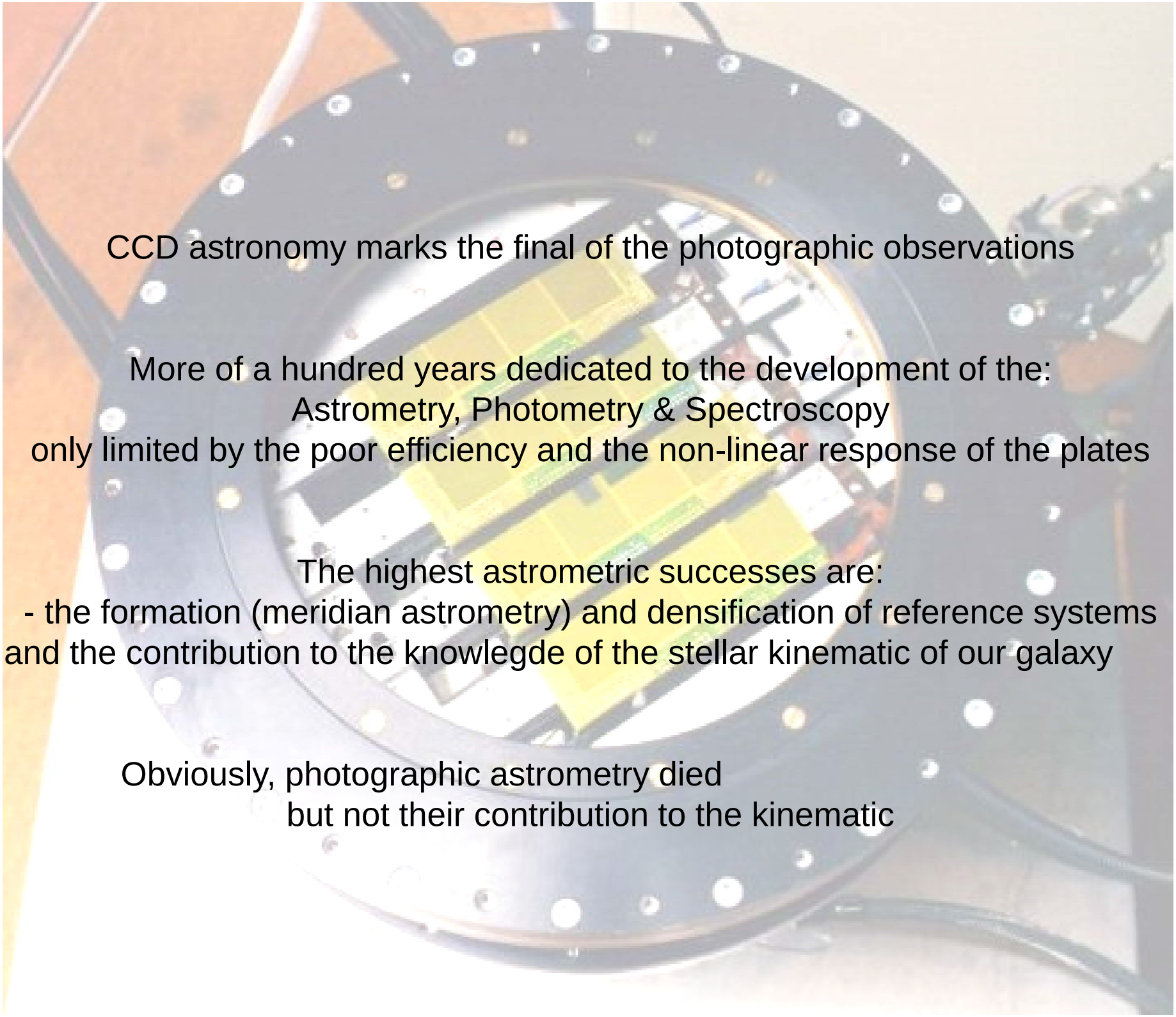
Photographic Astronomy

First epochs not yet published

Carlos Abad – CIDA - Venezuela



CCD astronomy marks the final of the photographic observations

More of a hundred years dedicated to the development of the:
Astrometry, Photometry & Spectroscopy
only limited by the poor efficiency and the non-linear response of the plates

The highest astrometric successes are:
- the formation (meridian astrometry) and densification of reference systems
- and the contribution to the knowlegde of the stellar kinematic of our galaxy

Obviously, photographic astrometry died
but not their contribution to the kinematic

There are important plate collections waiting scientific profit from latin-american old observatories

Observatorio de Tacubaya (UNAM-INAOE)
Observatorio de Córdoba
Observatorio de La Plata
Observatorio Astronómico Nacional de Chile - Cerro Calán
ROA
...

Proper motions are depending on:

- The precision of catalogues that contribute to the determination
- The size of the interval of epochs defined by these catalogues

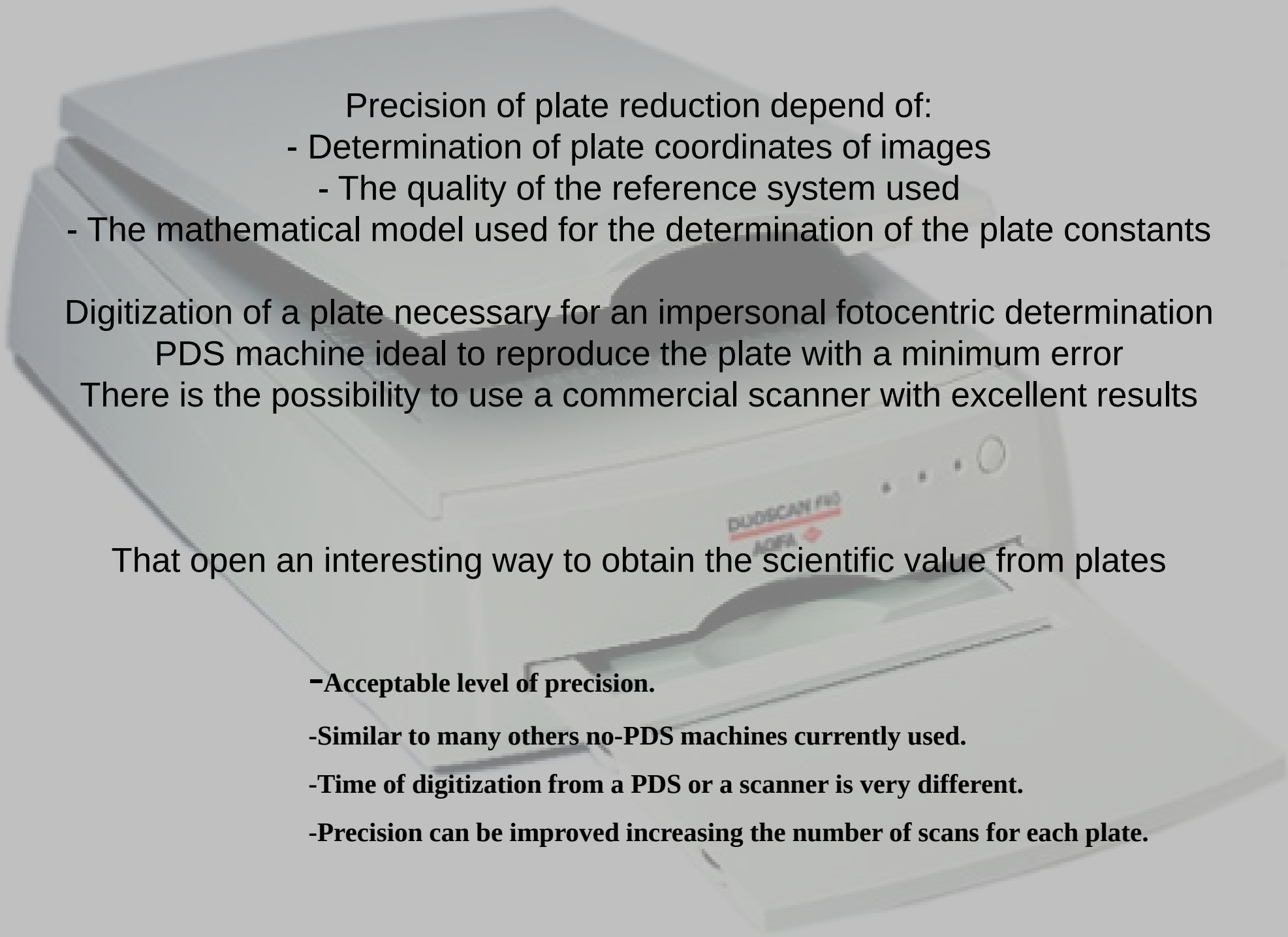
Logically, old-plates scientific contribution does not exclude their historical value

They still could be used as first epochs for proper motions determination

This could be an important contribution to the kinematics and dynamics of our galaxy

Precision of plate reduction depend of:
- Determination of plate coordinates of images
- The quality of the reference system used
- The mathematical model used for the determination of the plate constants

Digitization of a plate necessary for an impersonal fotocentric determination
PDS machine ideal to reproduce the plate with a minimum error
There is the possibility to use a commercial scanner with excellent results



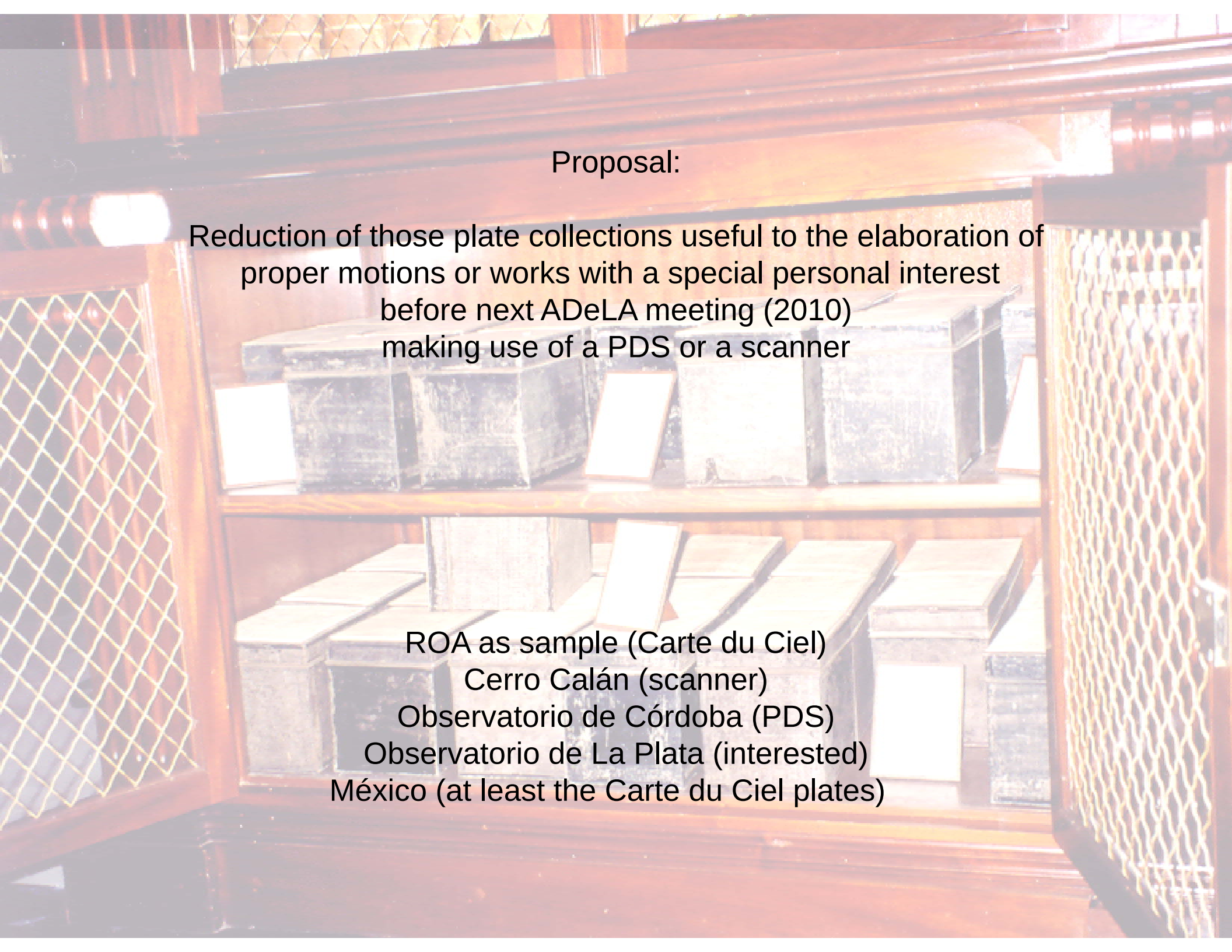
That open an interesting way to obtain the scientific value from plates

-Acceptable level of precision.

-Similar to many others no-PDS machines currently used.

-Time of digitization from a PDS or a scanner is very different.

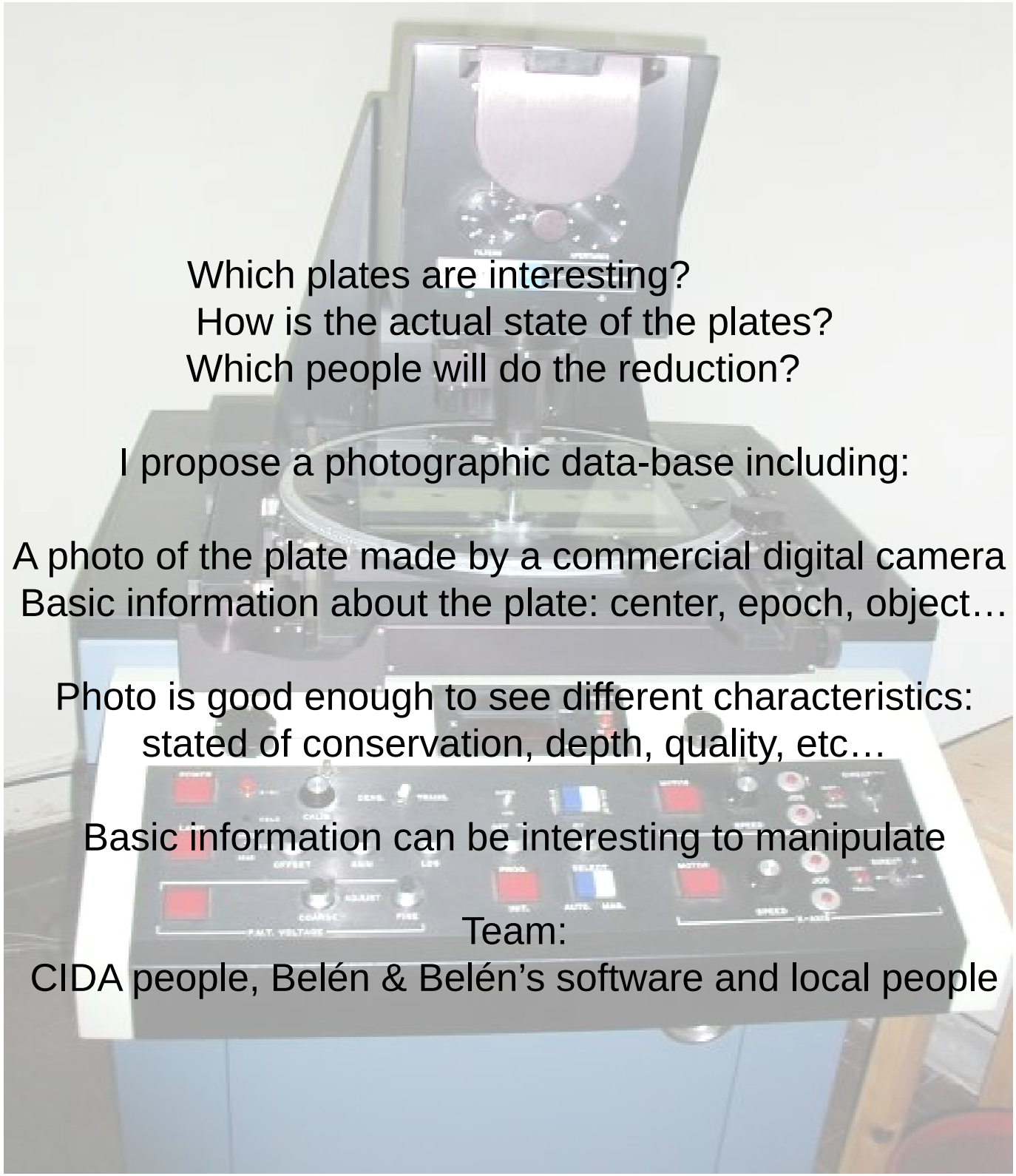
-Precision can be improved increasing the number of scans for each plate.



Proposal:

Reduction of those plate collections useful to the elaboration of proper motions or works with a special personal interest before next ADeLA meeting (2010) making use of a PDS or a scanner

ROA as sample (Carte du Ciel)
Cerro Calán (scanner)
Observatorio de Córdoba (PDS)
Observatorio de La Plata (interested)
México (at least the Carte du Ciel plates)



Which plates are interesting?
How is the actual state of the plates?
Which people will do the reduction?

I propose a photographic data-base including:

A photo of the plate made by a commercial digital camera
Basic information about the plate: center, epoch, object…

Photo is good enough to see different characteristics:
stated of conservation, depth, quality, etc…

Basic information can be interesting to manipulate

Team:
CIDA people, Belén & Belén's software and local people

The Photographic Data Base

309	NGC 2323		7	2.3	-8	18	821207	15
310	NGC 1513		4	8.5	49	27	821208	15
311	NGC 1513		4	8.5	49	27	821208	15
75	NGC 752		1	56.6	37	34	821208	15
312	NGC 1960		5	34.8	34	7	830118	15
313			8	2.0	5	38	830111	15
314	TRUMPLER 10		8	47.1	-42	24	830112	15
315	IC 2602		10	42.5	-64	17	830112	15
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380	TRUMPLER 10		8	47.1	-42	24	970307	30
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Astronomía Fotográfica

Unas primeras épocas todavía inéditas

Carlos Abad – CIDA - Venezuela

La astronomía CCD marcó el final de la astronomía fotográfica

Más de 100 años dedicados a la:
Astrometría, Fotometría y Espectroscopía
limitados por la pobre eficiencia y la respuesta no lineal de las placas

Sus mayores logros están relacionados con la formación
y densificación de los sistemas de referencia (astrometría meridiana)

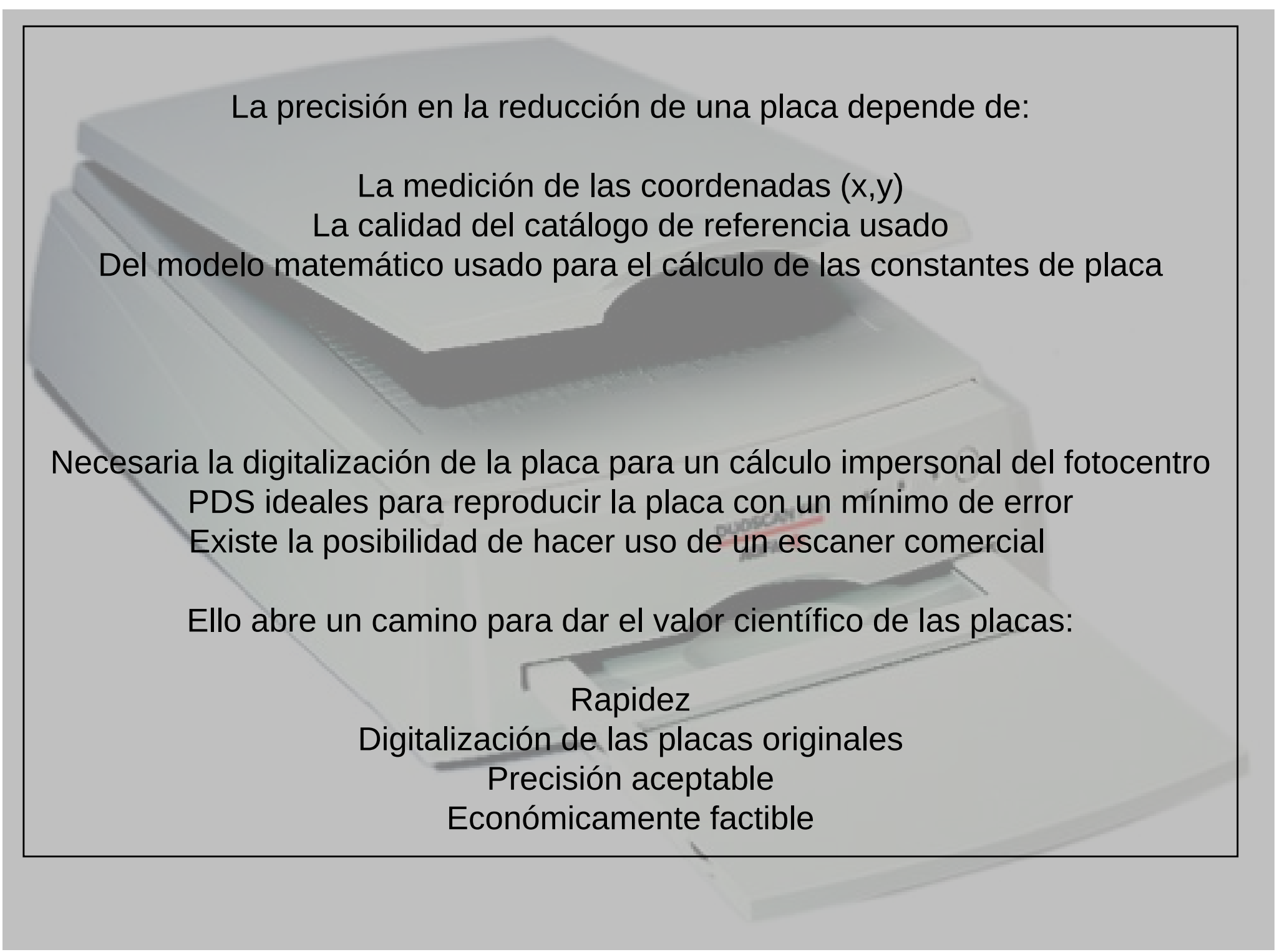
Es evidente que la época de las observaciones fotográficas acabó,
pero no su valor científico (aunque por tiempo limitado)

Existe una gran cantidad de placas todavía inéditas entre el material histórico de los observatorios Latinoamericanos

UNAM-INAOE-Tacubaya
Observatorio de Córdoba
Observatorio de La Plata (7000)
Observatorios Cerro Pachón y Cerro ….
ROA

Su valor radica en su aporte al conocimiento de la cinemática de nuestra galaxia
Pueden ser pimeras épocas para el cálculo de movimientos propios

Calidad en la determinación de movimientos propios depende:
Calidad de los catálogos en sus diferentes épocas
Amplitud del intervalo de épocas de los catálogos



La precisión en la reducción de una placa depende de:

La medición de las coordenadas (x,y)
La calidad del catálogo de referencia usado
Del modelo matemático usado para el cálculo de las constantes de placa

Necesaria la digitalización de la placa para un cálculo impersonal del fotocentro
PDS ideales para reproducir la placa con un mínimo de error
Existe la posibilidad de hacer uso de un escaner comercial

Ello abre un camino para dar el valor científico de las placas:

Rapidez
Digitalización de las placas originales
Precisión aceptable
Económicamente factible

Propuesta:
Activar la reducción de aquellas colecciones de placas
útiles para la elaboración de movimientos propios o trabajos de interés personal
antes del próximo ADeLA-2010
haciendo uso de la digitalización por medio de PDS o escaner

ROA como ejemplo (Carte du Ciel)
Cerro Pachón (dispone de un escaner Cannon…)
Observatorio de Córdoba (tiene sus propios medios – rapidez)
Observatorio de La Plata (existe el interés)
México (al menos placas de la Carte du Ciel)

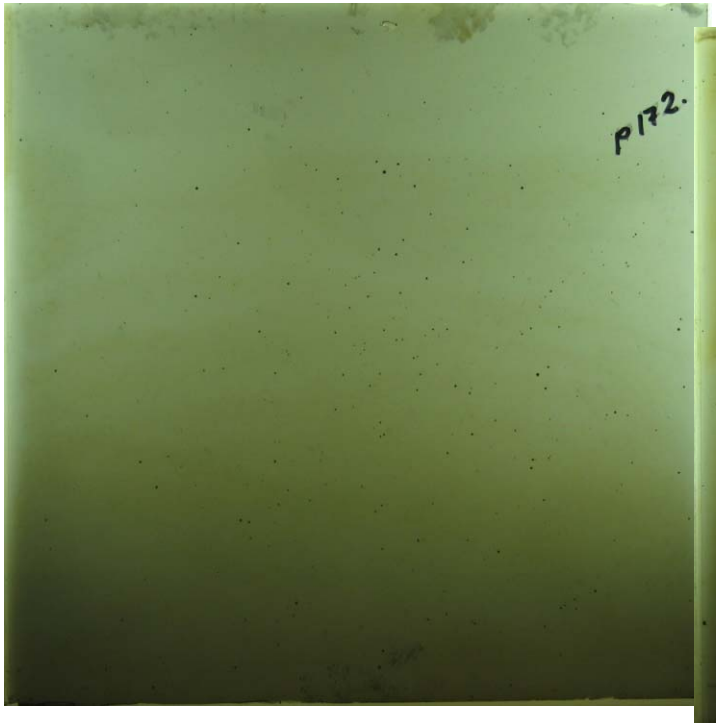
Quién realiza las reducciones?
Qué placas tienen interés?
Cómo conocer el estado actual de un placa?

Creación de una base de datos que facilitite información:
Calidad de conservación de la placa
Datos básicos sobre ella
Profundidad

Aprovechar la existencia de cámaras digitales comerciales

Una foto de la placa e información básica: centro, época y objeto

La foto es suficiente para ver el interés por ella
Centro, época y objeto puede ser una base de datos interesante de manipular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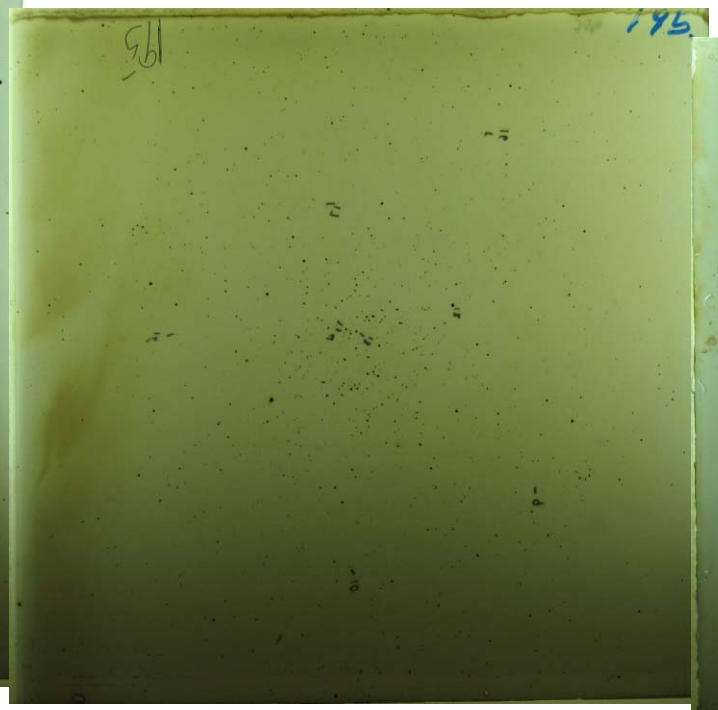
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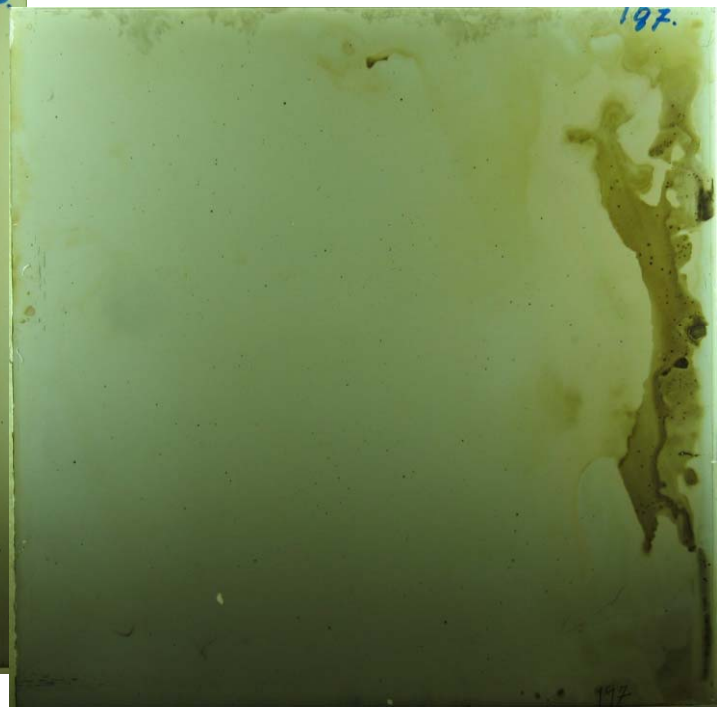
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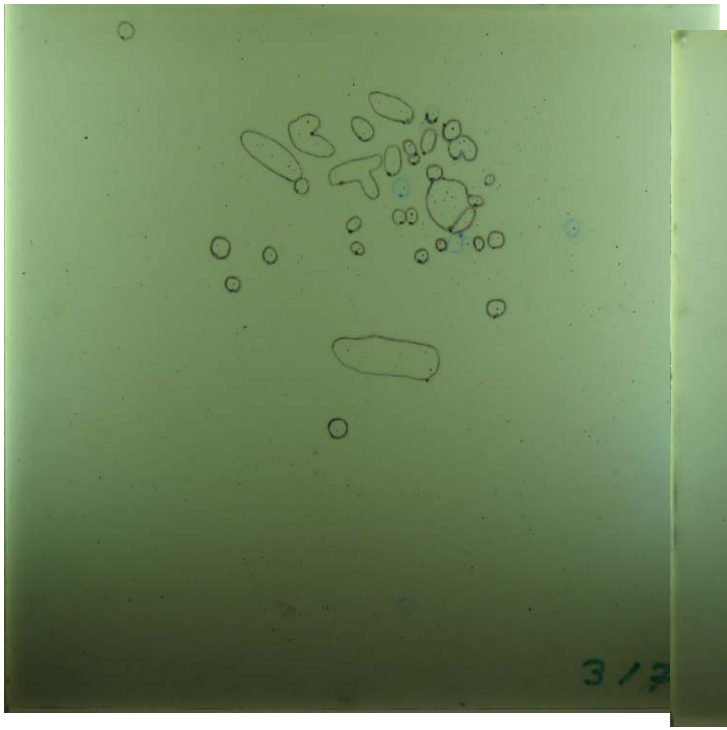
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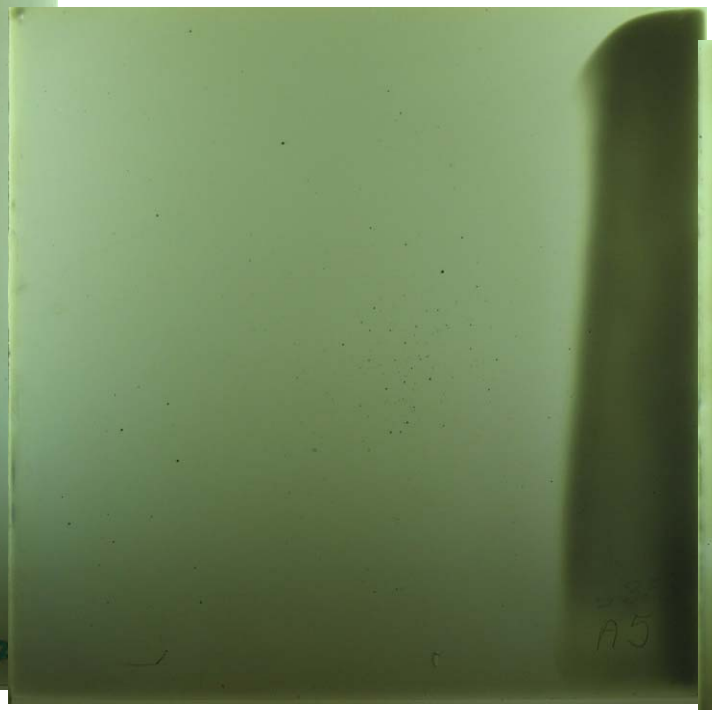
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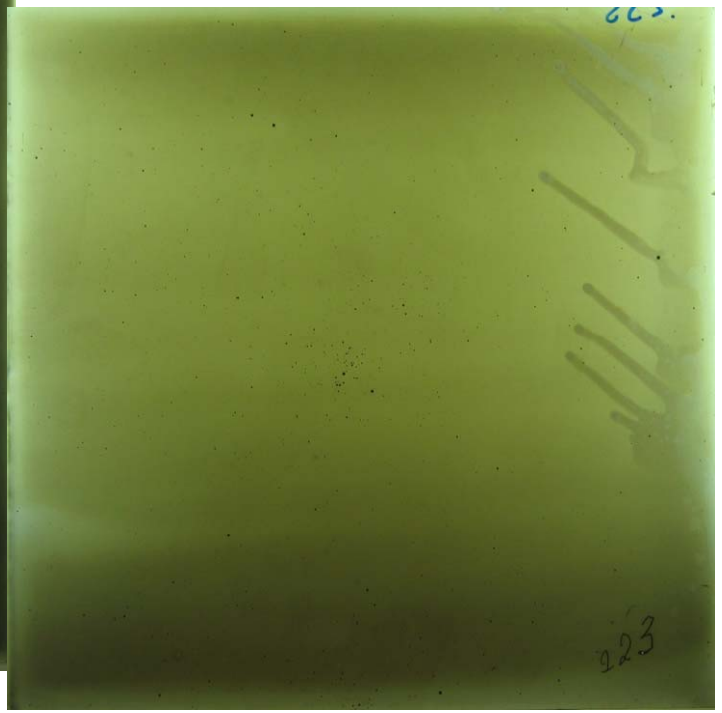
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The Photographic Data Base

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310	NGC 1513		4	8.5	49	27	821208	15
311	NGC 1513		4	8.5	49	27	821208	15
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312	NGC 1960		5	34.8	34	7	830118	15
313			8	2.0	5	38	830111	15
314	TRUMPLER 10		8	47.1	-42	24	830112	15
315	IC 2602		10	42.5	-64	17	830112	15
317	NGC 2323		7	2.3	-8	18	830118	15
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268	NGC 2323		7	2.3	-8	18	820125	15
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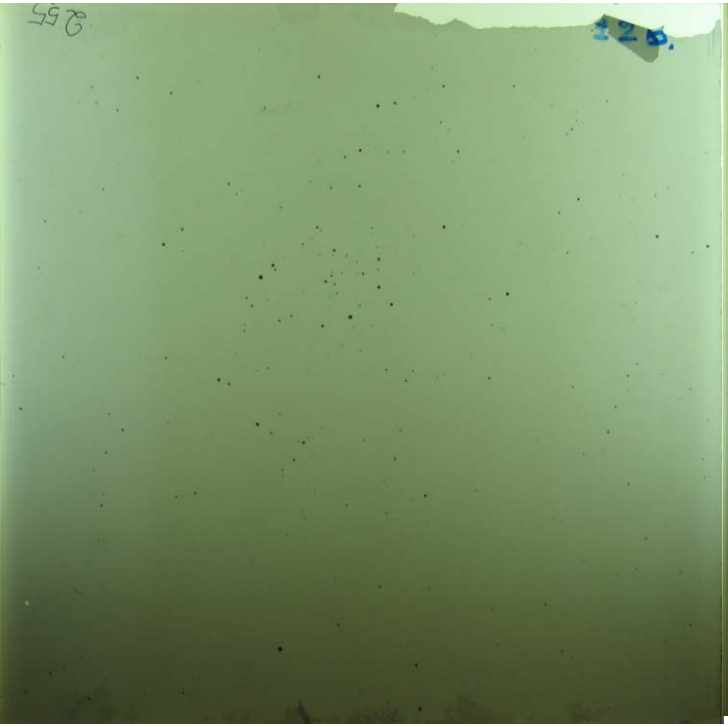
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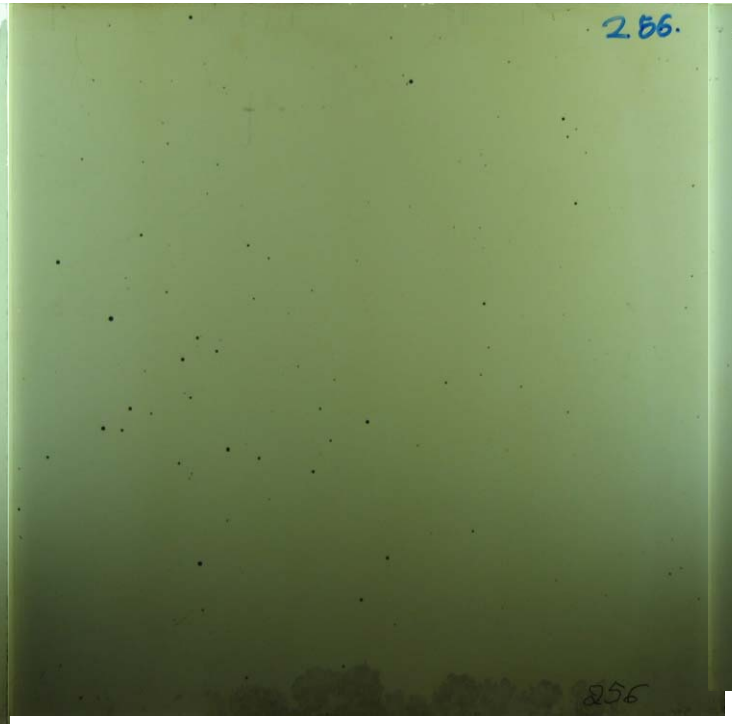
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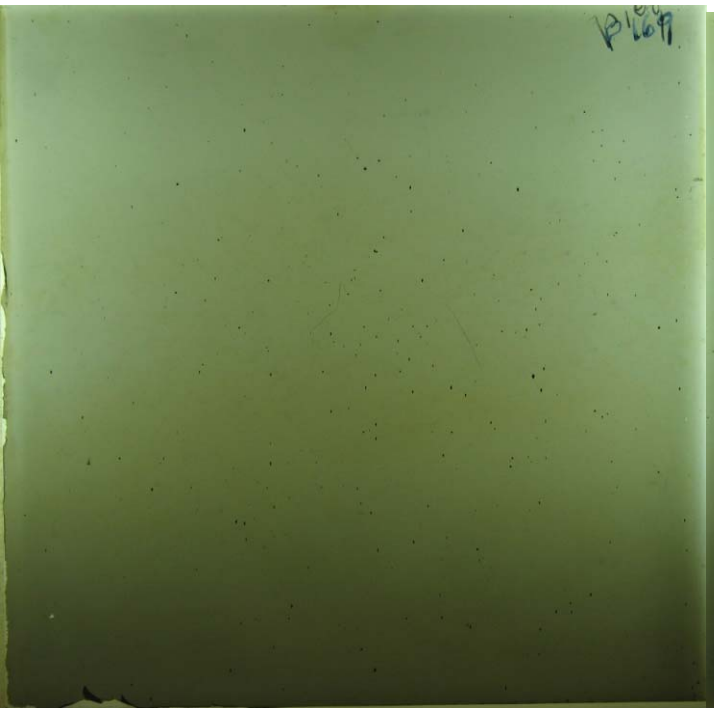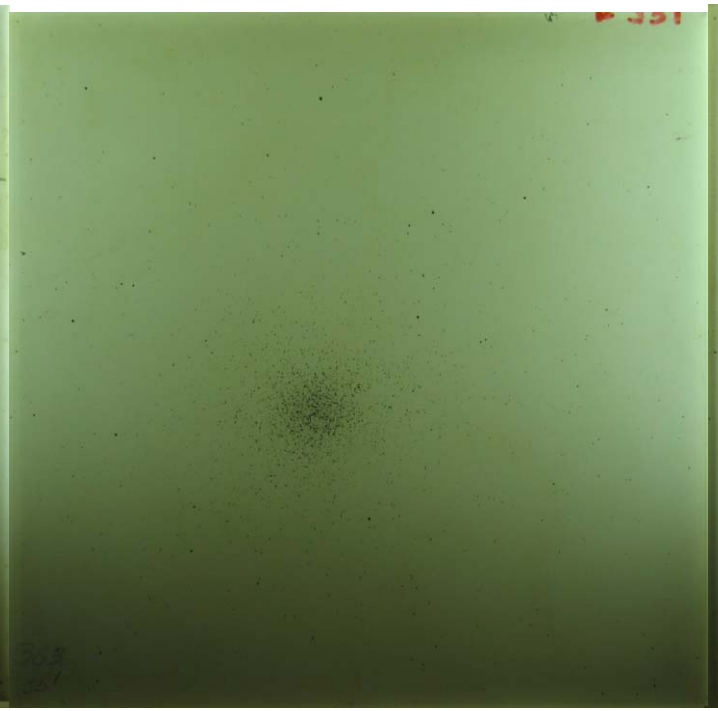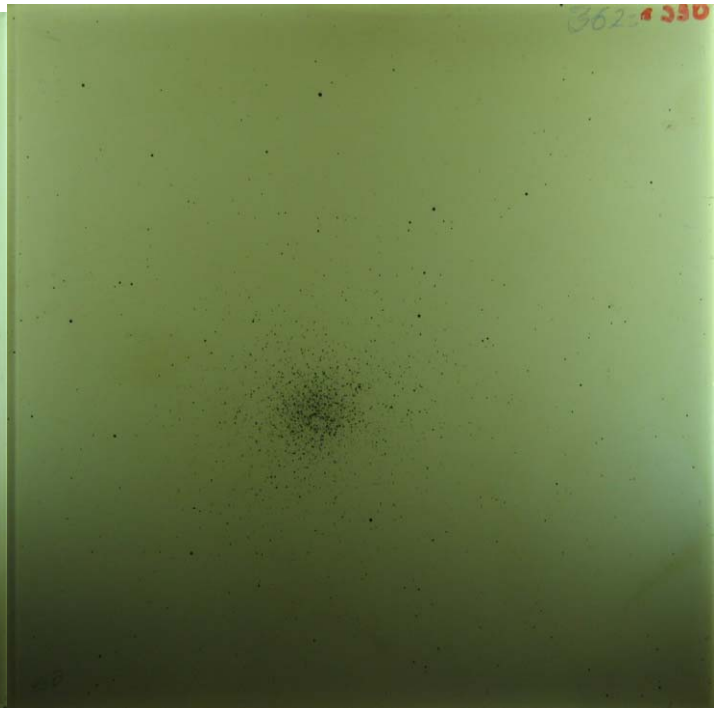
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