

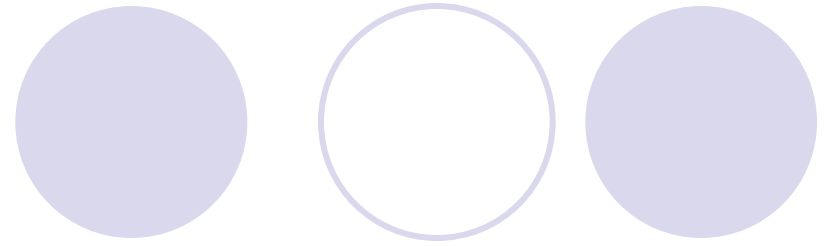
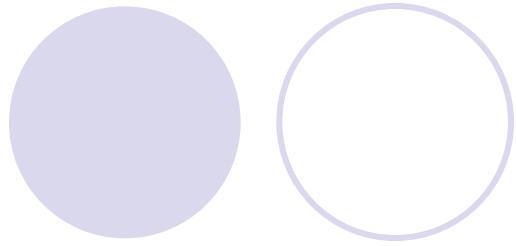


Overview



Masashi Hamanaka (Tagen)

Intensive Lecture in Chiba (2019/10/3)



**First of all,
I would like to thank
Kondo-sama for
invitation and all people
here for attendance !**

The top of the slide features five decorative circles arranged horizontally. The first, third, and fifth circles are solid light purple. The second and fourth circles are hollow with a light purple outline.

Kondo-san's requests :

**Anti-Self-Dual Yang-Mills
(ASDYM) equation,
integrable systems,
reduction,
twistor theory etc.**

Anti-Self-Dual Yang-Mills (ASDYM) equations

play important roles in

QFT (instanton, ADHM),

Geometry (Donaldson),

Integrable systems (←today)

relate to twistor theory



Integrable systems:

no definition


many aspects such as

many conserved quantities

infinite symmetry

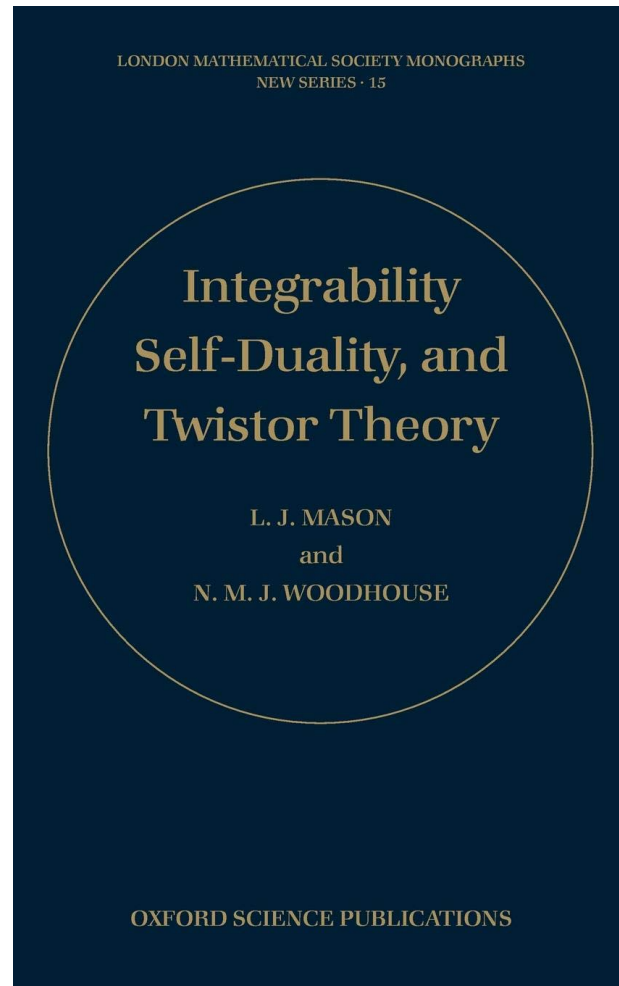
N-soliton solutions (←today)

solving initial value problem...

The text is decorated with five circles at the top: a solid light blue circle, a white circle with a light blue outline, a solid light blue circle, a white circle with a light blue outline, and a solid light blue circle.

Integrable systems:
connection to ASDYM is
conjectured by R. Ward:
many (perhaps all?) of
integrable equations may be
obtained from ASDYM
equation by reduction. (today)

Summarized in the book of Mason and Woodhouse



Twistor Theory

space time \leftrightarrow **twistor sp.**

4-dim

6-dim

field eqs. \leftrightarrow **geometry**
(difficult) **(easier)**

Found by
Roger Penrose

Brief history of twistor



1967 Twistor alg. (Penrose)

1976-78 Golden ages

1985 Ward conjecture

1990 twistor in 10-dim (Witten)

2003 Twistor string (//)

2013 Ambitwistor string (Mason-Skinner)

2021 Mason will visit Nagoya (conjecture by H)

2023 Much Progress ?

Plan of talk



10/3 Overview [slide], ASDYM

10/3 Introduction to twistor

10/3 Penrose-Ward trf.

10/4 Solitons [slide], integrable sys

10/4 Reduction of ASDYM

10/4 NC extension or ADHM or ...

(Note: I'm a physicist and Kansai-jin)