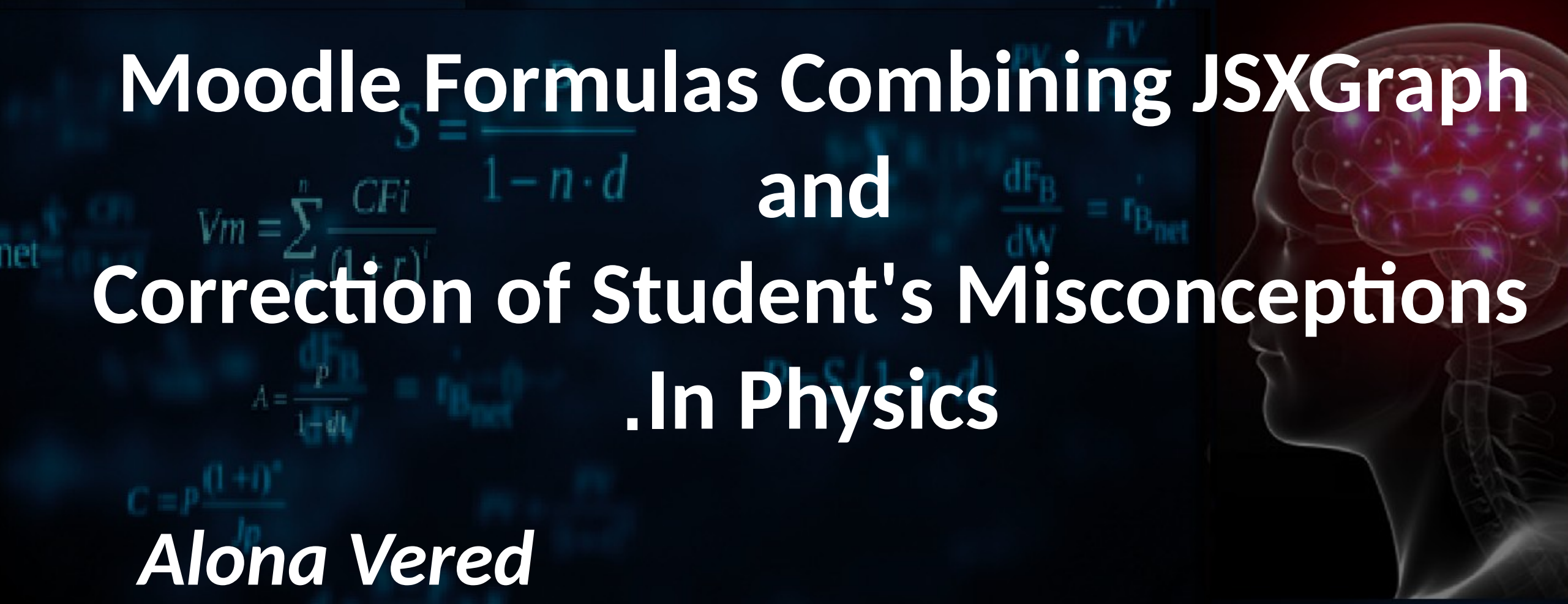
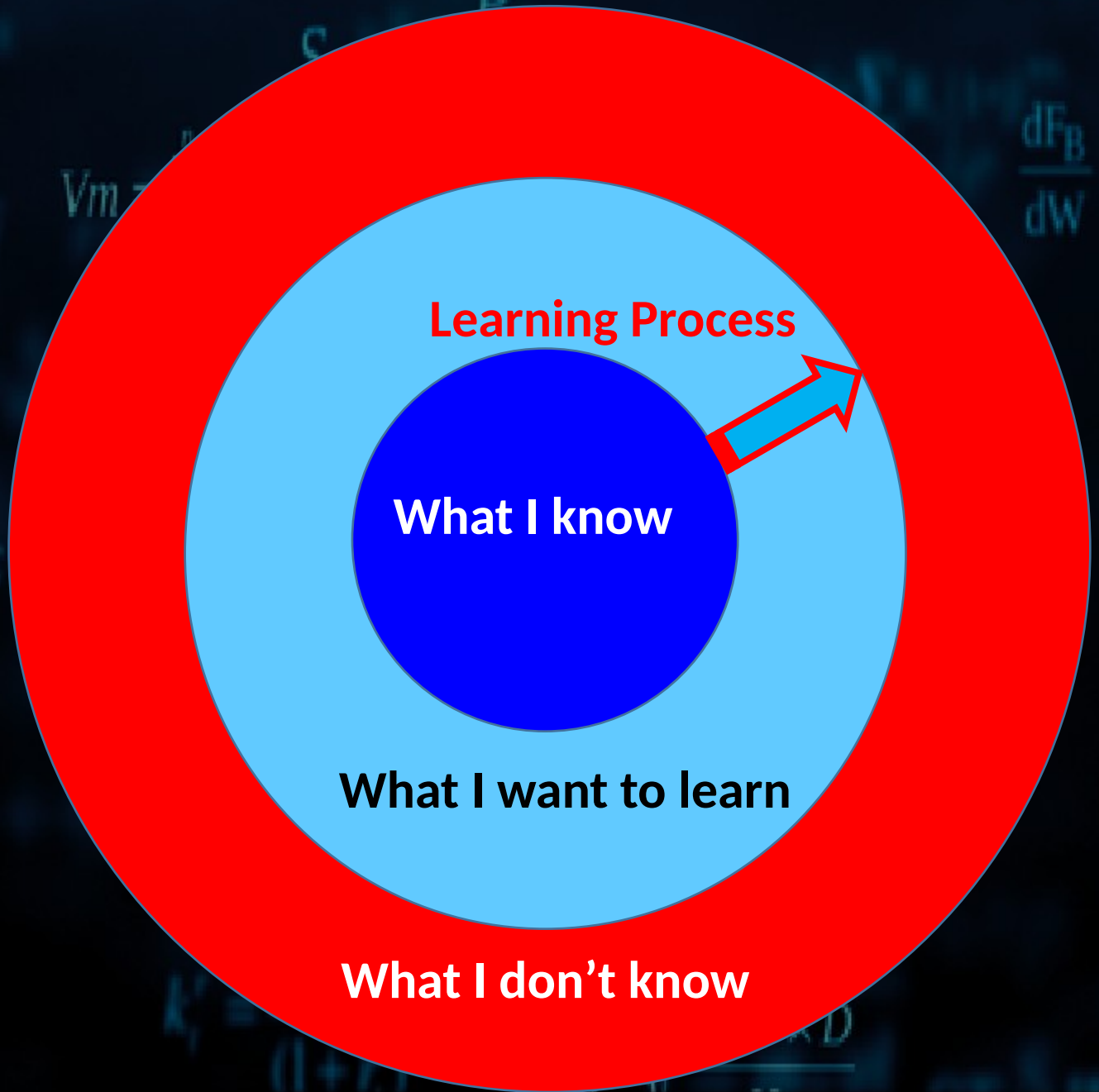
Moodle Formulas Combining JSXGraph and Correction of Student's Misconceptions .In Physics

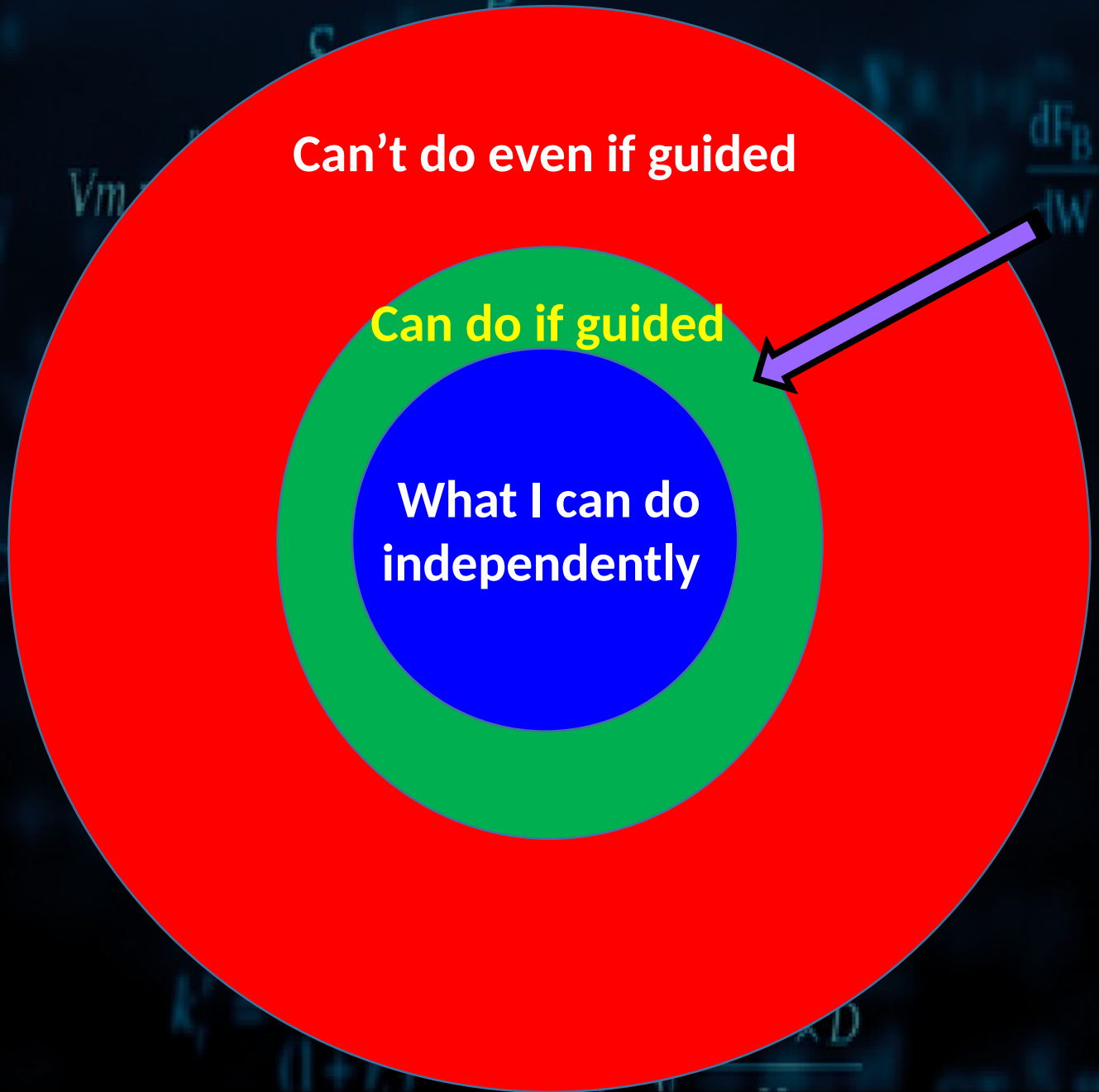


Alona Vered

HEMDA Schwartz-Reisman Science Education Center, Tel Aviv-Jaffo.

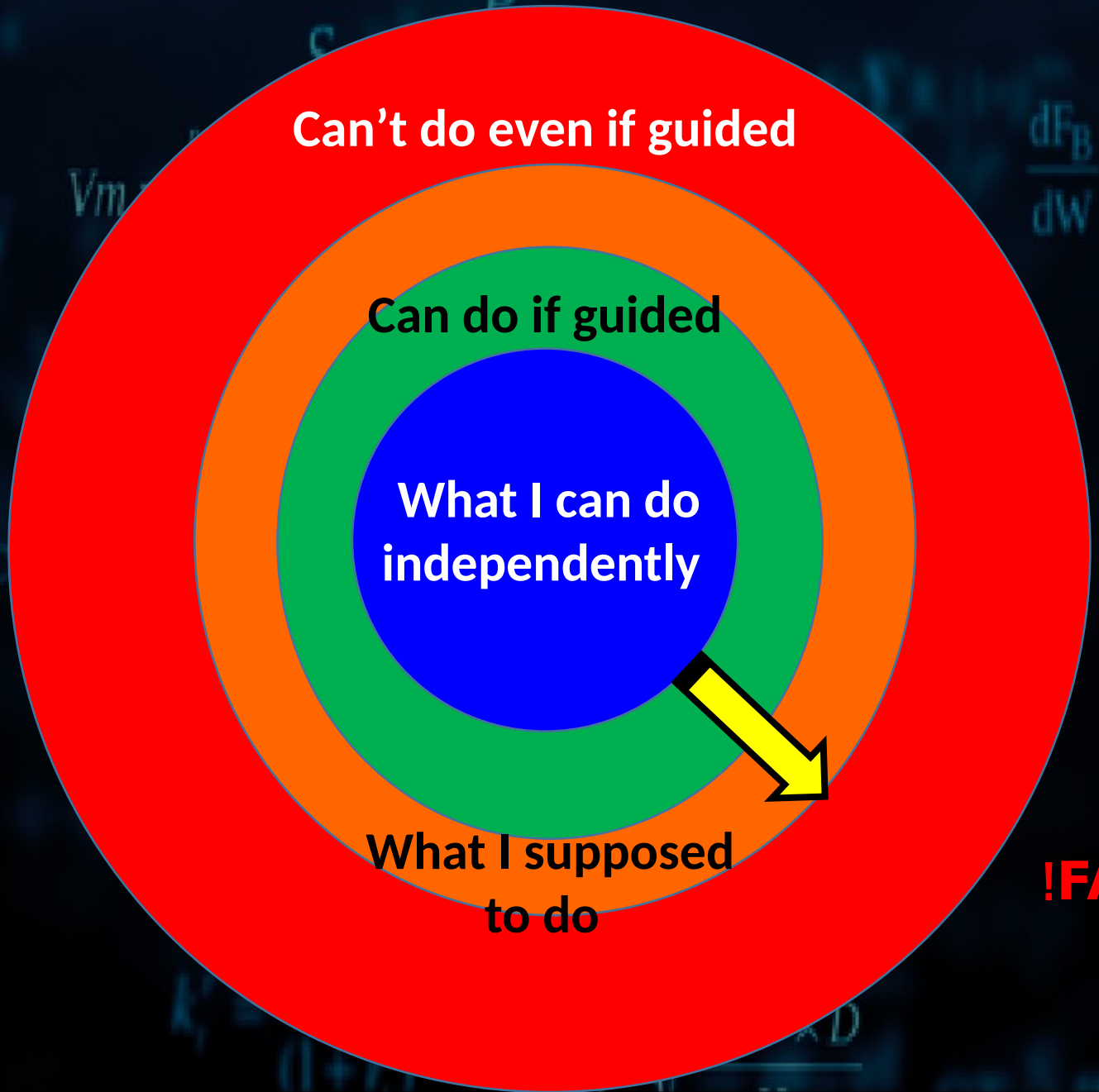

Learning Process
What I know
What I want to learn
What I don’t know

ZONE OF PROXIMAL DEVELOPMENT (by Lev Vygotsky)



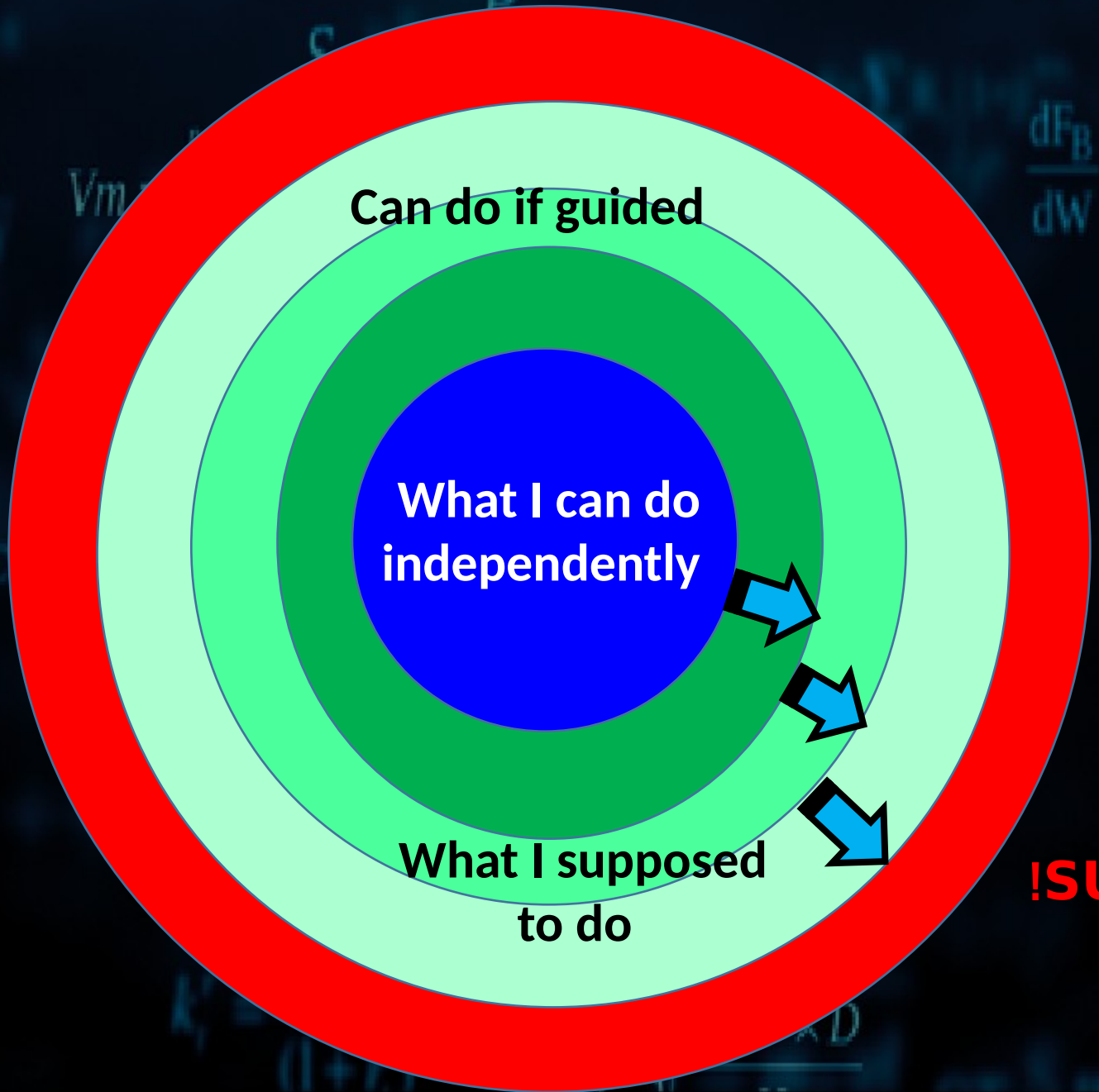
Zone of Proximal Development (ZPD)

ZONE OF PROXIMAL DEVELOPMENT (by Lev Vygotsky)



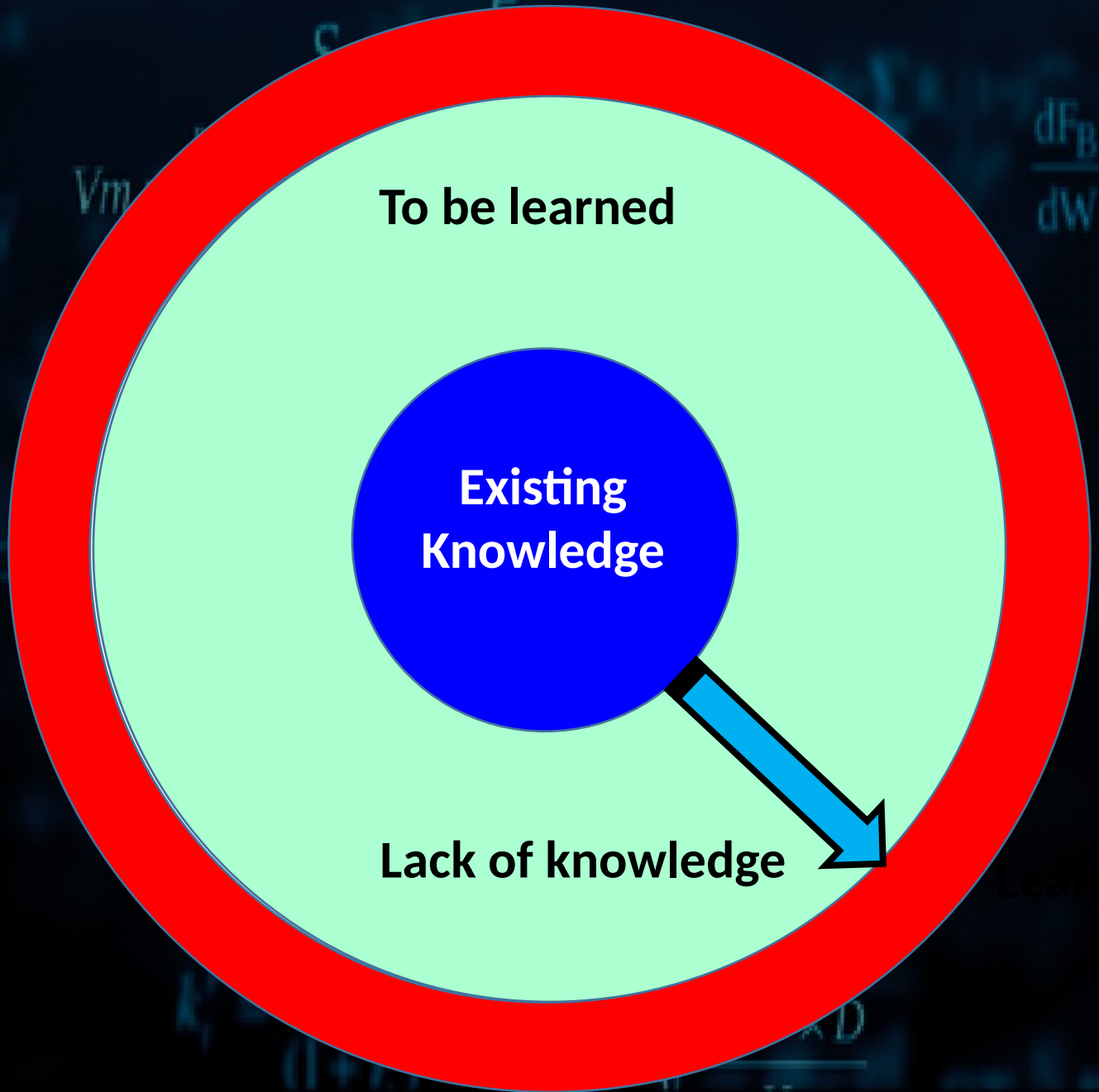
!FAILURE

ZONE OF PROXIMAL DEVELOPMENT (by Lev Vygotsky)



!SUCCESS

LEARNING PROCESS – COGNITIVE APPROACH



LEARNING PROCESS – COGNITIVE APPROACH

!FAILURE

Misconception ≠ Lack of conception

Misconception = Alternative conception

Observing everyday events

COHERENCE THEORY

Learner develops naive ideas in a internally coherent way

New idea will be judged against already existed internally coherent concept (misconception)

New idea may be rejected because it does not fit learner

LEARNING ≠ CREATE COMPLETELY NEW CONCEPTION

LEARNING = PROMOTE CONCEPTUAL CHANGE

? WHAT TEACHER SHOULD DO

- ✓ PROVOKE **DISSATISFACTION** WITH EXISTING CONCEPT
- ✓ INDUCE **CONFLIST OF CONCEPTS**

HOW IT CAN BE ? DONE

- ✓ CREATE **SMALL-STEP EVOLUTION** OF CONCEPTS
- ✓ LET STUDENTS FACE **CONTRADICTIONS** OF NEW DATA WITH EXISTING MISCONCEPTION – STUDENTS-LED ACTIVITIES

MISCONCEPTION IN KINEMATICS

Many students see physics as just a collection of mere formulas and do not understood the meaning. This is a reason why they think physics is difficult.

Students only memorize the formula and only skillfully perform the calculations without understanding the meaning or concept that is beir learned.

Students have difficulties to translate from an actual motion to its representation on a graph and from the graph to an actual motion.